

0072758

**HARD COPY DISTRIBUTION
UNIT MANAGERS' MEETING,
200 AREA GROUNDWATER SOURCE OPERABLE UNITS
March 15, 2007**

DOE/RL

(No hard copy distribution)

EPA

Craig Cameron

B1-46

Ecology

John Price

H0-57

FH

Janice Williams (original)

E6-35

Administrative Record (2)

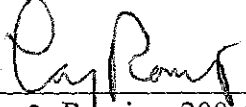
H6-08

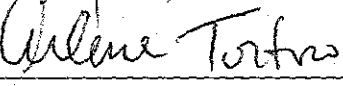
Correspondence Control

A3-01

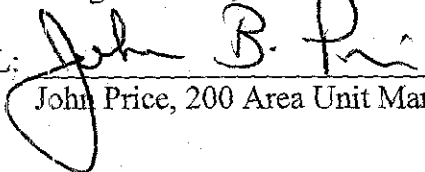
RECEIVED
APR 26 2007**EDMC**

Meeting Minutes Transmittal/Approval
Unit Managers' Meeting
200 Area Groundwater and Source Operable Units
1200 Jadwin Avenue, Richland, Washington
March 15, 2007

APPROVAL:  Date: 4-18-07
 Larry Romine, 200 Area Unit Manager, DOE/RL

APPROVAL:  Date: 4/18/07
 Arlene Tortoso, 200 Area Assistant Manager, DOE/RL

APPROVAL:  Date: 4/24/07
 Craig Cameron, 200 Area Unit Manager, EPA

APPROVAL:  Date: 4/24/2007
 John Price, 200 Area Unit Manager, Ecology

Minutes of the 200 Area Unit Managers' Meeting of March 15, 2007 are attached.
Minutes are comprised of the following:

Attachment 1	Agenda
Attachment 2	Attendance Record
Attachment 3	Agreements and Issues List
Attachment 4	Action Item List
Attachment 5	Groundwater Operable Units Status
Attachment 6	200-UP-1 Rebound Study, Technetium-99
Attachment 7	200-UP-1 Rebound Study, Uranium
Attachment 8	Tc-99 concentrations in extraction wells 299-W15-44 and 299-W15-765
Attachment 9	Tc-99 concentrations in monitoring well 299-W15-763
Attachment 10	Trend data for carbon tetrachloride in well 299-W15-6
Attachment 11	Approval of the Carbon Tetrachloride Expedited Response Action Soil Vapor Extraction System Operating Plan for FY 2007
Attachment 12	Comparison of Maximum Carbon Tetrachloride Rebound Concentrations Monitored at 200-PW-1 Soil Vapor Extraction Sites FY 2003 – FY 2007
Attachment 13	Borescope flow measurements
Attachment 14	In Situ Velocity Flowmeter Test Wells in the 216-BY Cribs Plume
Attachment 15	Average Uranium concentrations in Northwest 200 East Area, Upper Part of Unconfined Aquifer
Attachment 16	Locations of Proposed Wells Associated with 200-BP-5 Operable Unit

- Attachment 17 Completed Transects in the B/BX/BY WMA and surrounding waste sites.
- Attachment 18 Source Operable Units Status
- Attachment 19 WMP-20205 Rev 1, Figure 1 Replacement, 216-A-4 & 216-A-21 Cribs Location Map and Waste Container Storage Area

200 AREA UNIT MANAGERS' MEETING DRAFT AGENDA

1200 Jadwin/Rm 1-C-1
March 15, 2007

GROUNDWATER AND SOURCE OPERABLE UNITS (8:30-9:45)

- Status Review of OUs
- Outstanding Action Items/Issues

200-UW-1, 200-CW-3 AND FACILITIES (9:45-10:15)

- Status Review
- Outstanding Action Items/Issues

200 Area Unit Managers Status Meeting March 15, 2007

Please print clearly and use black ink

PRINTED NAME	ORGANIZATION	O.U. ROLE	TELEPHONE
Janice Williams	FH	Lead	372-3553
Jennie Seaver	Ecology	200 area OU	372-7956
GLORIA Cummins	FH	PO-1 LEAD	372-2484
Arlene Tortoso	DOE-RL	200 Area	373-9631
Mark Byrnes	FH	200 Area	373-3996
Virginia Rohay	FH	PW-1	373-3803
JEAN Harni	ECOLGY	Permitting	372-7930
Zelma JACKSON	ECY	UP-1 PO-1 HG	372-7910
Tom Watson	Fluor	200 E	376-5450
Pam Ankrum	Fluor	200 Surface Soil Sites	373-7222
Jon Lindberg	PNNL	200-PO-1	376-5005
Ann Shattuck	FH	200-MW-1 200-PW-1/3/6	376-8756
Tom Post	EPA	200 Area	376-6623
Larry Fitch	FH	200 Area	376-7536
Bryan Foley	DOE	200 Area	376-7087
Tim Berube	FH	BC Cnbs	6-0002
Mike Hickey	FH	IS-1 CW-1	373-3072
Larry Remay	RL	200A	376-4747
Michael Stevens	FHB	200-UW-1	4305756

200 Area Unit Managers Status Meeting March 15, 2007

Please print clearly and use black ink

PRINTED NAME	ORGANIZATION	O.U. ROLE	TELEPHONE
R Douglas Hildebrand	DOE-RL	200-BP-5	373-9626
Brian Charbonneau	DOE-RL	624/15	373-6137
David Erb	FH	200-WT Tech Supt	373-4457
Ron Brunke	FH	OP-1 CWB PW-2 CS-1	
Scott Worley	FC	Decommission	376-5660
Jennifer Dillard	Ecology	221-U	372-7988
L. Craig Swanson	FH	Technical Supp.	373-3807
John Winterhalter	FH	Environ	372-8144
Frank Roddy	DOE/RL	SW-142 VR-1 LWT-1 decommission	372-6945
JENNIFER FOLLO	S&BS		
STELLA C. GARDNER	OREGON		
Ted Repasky	CTUIR		541-966-2412
R. Jeff Serne	PNNL	BP-5	509-376-8429
Greg Thomas	FH	BP-5	373-3907
Craig Cameron	EPA		376-8668
ROB PIERCE	FH		373-3285

**Issue Resolution Meeting
Agreements and Issues List
March 15, 2007
200 Area Unit Managers' Meeting**

Agreement: None Identified

Issue: As a result of the EPA training, there is a concern about whether the contents of the Administrative Record for CERCLA remedial actions need to be evaluated to ensure the appropriate ARAR information is being captured in the record.

**200 Area Unit Managers' Meeting
OPEN ACTION ITEMS & TRACKING**

Action #	Action/Subject	Assigned To	Owed To	Assigned Date	Original Due Date	Adjusted Due Date	Date Complete	Status
78	Present IS-1 DQO briefing to HAB. RL to request time slot on HAB River & Plateau Committee for this briefing.	DOE-K. Leary	All	8/23/06	9/21/06	4/15/07		November date could not be met. Due date pushed 4 months per K. Leary.
80	Send report from Remedial Action Decision Making panel (Tom Fogwell)	FH-M. Byrnes	ECY/EPA Price/Goswami/Cameron	10/18/06	11/16/06	3/30/07		Panel requested more time to complete their report.
81	Prepare a short overview of the BP-5 Work Plan for Ecology Tank Farms personnel (Include Rod Lobos-EPA).	FH-G. Thomas	J. Lyons/D. Goswami/ J. Caggiano	3/15/07	4/18/07			
82	Provide a schedule for the construction of the ETF connections for T-Area wells	FH-M. Byrnes	D. Faulk	3/15/07	4/18/07			
83	Resolve the wording required to use single-walled piping for the T-Area wells	FH-M. Byrnes	J. Stults	3/15/07	3/27/07			
84	Provide an overview of the correlation of soil characterization data to HRR for BC Crib.	FH-M. Benecke	J. Stults	3/15/07	3/27/07			

200-UP-1, 200-ZP-1, AND 200-PW-1 GROUNDWATER OPERABLE UNITS

March 15, 2007

GROUNDWATER OPERABLE UNITS STATUS

200-UP-1 OU

- Rebound Study:
 - Tc-99 and uranium concentrations are still below the interim RAOs of 9,000 pCi/L and 480 µg/L respectively (**Attachments 6 and 7**).
 - Uranium concentrations in well 299-W19-37 have now risen above 300 µg/L.
 - Ecology update on the Explanation of Significant Difference (ESD) for the UP-1 interim ROD. Zelma Jackson stated that the ESD would be complete in a matter of weeks.
- RI/FS Work Plan:
 - Six of 12 new 200-UP-1 wells (UP1, UP2, UP3, UP4, UP5, and UP11) required by the RI/FS Work Plan have been installed. The remaining six are scheduled for early FY2008.

200-ZP-1 OU

- Remediation Treatment Status:
 - Between October 1, 2006 and March 4, 2007 the 200-ZP-1 pump-and-treat system average pumping rate was approximately 262 gpm.
 - As of the end of the day Tuesday, March 13, nine of the 10 200-ZP-1 extraction wells were on line pumping at approximately 250 gpm. The pump in extraction well #5 failed this past weekend and is in the process of being investigated prior to being replaced. The pump in extraction well #4 was replaced yesterday with a larger pump to boost the pumping rate by 10 or more gpm. Adjustments are still being made to this well.
 - **Attachments 8 and 9** show the most recent Tc-99 concentrations in extraction wells 299-W15-765 and 299-W15-44, and nearby monitoring well 299-W15-763. The average Tc-99 concentration of the mixed extraction water entering the ZP-1 treatment building is approximately 42% of the MCL of 900 pCi/L.
 - Dennis Faulk requested that the handouts be titled "200-ZP-1" in the future for clarification purposes.
 - The Final Treatability Test Plan for Tc-99 removal from extraction wells W15-44 and W15-765 has received all the FH signatures and is now being released to DOE-RL.
 - The Purolite resin treatment skids are being constructed and are scheduled to be delivered to Hanford the last week in March 2007. We are currently looking at a mid April hookup.

- Trend data for carbon tetrachloride in well 299-W15-6 is presented in **Attachment 10**.
- Dennis Faulk requested that for future meetings we need to status the hookup of the two T Tank Farm wells to the ETF line.
- Dennis Faulk, Arlene Tortoso, and Jenny Seaver requested to be invited to attend the Ecology visit to the 200-ZP-1 treatment facility to observe the monitoring of the above ground single walled extraction well lines.
- RI/FS Status:
 - FS Report:
 - Document is on schedule.
 - Completed the detailed analysis of alternatives except for cost estimating.
 - Comparative analysis of alternatives will begin shortly.
 - Baseline risk assessment and groundwater analysis will be completed in the next month.
- Tc-99 Investigation Status:
 - Drilling has started on the T-4 well (C5243, 299-W11-48). They are currently at a depth of approximately 195 ft bgs as of 3/12/07.
 - The draft DQO summary report (WMP-28389) was issued to DOE-RL for stakeholder review.

200-PW-1 OU

- Soil Vapor Extraction System (SVE):
 - The SVE system will be turned back on April 1, 2007 at Z-9 Area.
 - The Carbon Tetrachloride Expedited Response Action Soil Vapor Extraction System Operating Plan for FY 2007 was provided to DOE-RL and EPA for approval. The approved plan is attached to these meeting minutes (**Attachment 11**)
- The passive system remains operational.
- Monthly monitoring results for February 2007 are presented in **Attachment 12**.

200-PO-1 GROUNDWATER OPERABLE UNIT

March 15, 2007

GROUNDWATER OPERABLE UNIT STATUS

200-PO-1 OU

- **DQO**

The DQO process continued for a 200-PO-1 OU investigation effort. A Decision Makers' meeting was held February 15 to review the study boundaries as part of DQO Step 4 for inclusion in the Draft RI/FS Work Plan.

- **SAP**

Work started in January on a draft 200-PO-1 Characterization SAP to support the RI/FS Work Plan development. This SAP along with the existing Monitoring SAP (DOE/RL-2003-04 Rev.1) will be included in the Draft A Work Plan due to Ecology September 30, 2007. A meeting was held with Ecology hydrogeologists on March 8 to get input on primary hydrogeologic study areas as they relate to the draft principle study questions in the DQO.

- **WORK PLAN (no change)**

Work continued on drafting the 200-PO-1 Draft A Work Plan. Ecology is moving forward on the Site-wide permit renewal.

- **INTEGRATION**

The 216-A-4 well being drilled by waste sites has reached groundwater and will be completed as a 200-PO-1 OU monitoring well. The well has been built and is waiting to be developed in the next few weeks.

200-BP-5 GROUNDWATER OPERABLE UNIT

March 15, 2007

GROUNDWATER OPERABLE UNIT STATUS

Questions from last UMM.

1) Rod Lobos, EPA, wants DOE to look into using the colloidal borescope method to determine groundwater flow direction.

Borescope flow measurements were completed in 2000 for the groundwater beneath and proximal the B/BX/BY WMA as part of the B/BX/BY RCRA Assessment, PNNL-13404 (see Figure 1, **Attachment 13**). At the time groundwater flow direction was reported south in 13 of the 17 wells selected for the test. The flow velocities in these wells were not reported.

The results corroborate previous In Situ Velocity Flowmeter Tests completed in 1994 for the 200-BP-5 Operable Unit Treatability Test Report, DOE-RL-95-59, Rev. 0. The report concluded a southern flow direction in the four wells located beneath and west of the BY cribs and BY tank Farm (see Figure 2, **Attachment 14**). The method used thermal perturbation methods at various levels within each well. The flow velocity varied in the wells from 0.43 ft/day to 1.6 ft/day.

Recommended course of action: Complete tracer study to determine flow rate. This would provide a fourth method for the study of flow in the northwest portion of the 200 East Area. A test is proposed for well 299-E33-34 which is located in the uranium plume outlined in the recent PNNL Annual report, PNNL-16346 (Figure 3, **Attachment 15**). This test would provide the necessary information for capture zone calculations and thus determine potential extraction well placement for the uranium plume. It should be noted that recent linear uranium plume contouring indicate that the uranium plume has not significantly moved over the past five years in the B/BX/BY WMA area.

2) It was suggested that historic cyanide groundwater results for wells proximal to wells "I" and "J" should be researched for the late 1980s.

Cyanide Results

Date	6/1/1988	8/29/1988	1/17/1989	2/20/1991	8/8/1991	10/8/1992	8/31/1994	4/24/1995
Units	ug/L.	ug/L	ug/L	ugu/L	ug/L	ug/L	ug/L	ug/L
Lab qualifiers								
699-49-57A	28	12.8	28.3	31.5	31.6	50.1	68.2	90

Date	6/6/1988	9/15/1988	1/17/1989	2/20/1991	8/8/1991	10/9/1992	8/30/1994	4/28/1995
Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Lab qualifiers								J
699-50-53A	1360	1110	633	164.3	119	401	245	490

Uranium Results

Date	2/20/1991	8/8/1991	10/8/1992	10/13/1994	4/21/1995
Units	ug/L	ug/L	ug/L	ug/L	ug/L
Lab qualifiers	J		J		
699-49-57A	2.3	2.8	2.6	2.4	2.92

Date	2/20/1991	8/8/1991	4/14/1992	10/9/1992	10/28/1994	4/28/1995
Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Lab qualifiers	J	J	J	J		
699-50-53A	6.25	5.5	5.9	6.3	5.89	5.17

Date	2/25/1991	8/7/1991	4/10/1992	10/28/1994	4/28/1995
Units	ug/L	ug/L	ug/L	ug/L	ug/L
Lab qualifiers	J		J		
699-52-57	3.6	7.5	4.8	1.63	0.88

Analytical Status for I and J Wells: (See Figure 4, Attachment 16)

"I" well (699-48-50B):

- 1) Elevated uranium-238 porewater results, completed by PNNL, were reported in the silty sand to clay-silt sediments approximately 6 to 10 feet above the basalt.
- 2) Groundwater contact with these sediments would have been from 1960-1992 based on groundwater elevations at 699-49-57A.
- 3) Fluor concludes that either naturally occurring placer deposits are the reason for the elevated uranium or a uranium plume may have been present during a higher groundwater elevation time period, 1960 to 1992.
- 4) Porewater concentrations were reported between 4.69 ug/L and 86.57 ug/L.
- 5) Moisture content for these intervals ranged from 24.79 to 25.96%.
- 6) Based on moisture and porewater concentrations infiltration could average up to 30 ug/L.
- 7) Isotopic groundwater uranium concentrations were reported at the following:
 - a. U-233/234 – 1.3 pCi/L
 - b. U-235 – 0.083 pCi/L
 - c. U-238 – 0.88 pCi/L
- 8) Background concentrations for uranium isotopes are as follows based on DOE/RL-92-23.
 - a. U-233/234 – 1.54 pCi/L
 - b. U-235 – 0.24 pCi/L
 - c. U-238 – 1.64 pCi/L

Discussion: Kevin Leary, RL, suggested that colloid transport should be investigated. At Yucca Mountain the Pu was found to be transported by colloids. There could be a similar situation happening with U at Hanford.

Response: All vadose zone pore waters, all vadose zone sediments, all aquifer sediments and all groundwaters at Hanford have measurable uranium in them from natural causes and sometimes Hanford activities. We are suspicious that a few of our vadose zone pore waters in C5197 and one in C5196 seem higher than natural background values. However,

our data base is small regarding porewater analysis for various sediments. We will get some of the samples run at LBNL for U isotope signature which will conclusively determine via U-236 whether there is Hanford U present. Since we do not have signatures for other crib or trenches in the WMA identifying the source will not be until further characterization is completed for the surrounding waste sites.

"J" well (699-50-56):

- 1) One elevated uranium-238 porewater result was reported in a silty sand approximately 18 feet above the aquifer. This elevation is 8 feet higher than any historical groundwater elevation, 1950 to present.
- 2) Uranium-238 porewater results, in the sediment 10 feet above the aquifer, ranged between 2.71 ug/L and 7.17 ug/L.
- 3) Moisture content for these intervals ranged from 2.52% to 9.48%.
- 4) Fluor concludes from the results that naturally occurring uranium deposits are the reason for the uranium concentrations reported in the sediments from the aquifer to ten feet above the aquifer.
- 5) Isotopic groundwater uranium concentrations were reported at the following:
 - a. U-233/234 – 0.640 pCi/L
 - b. U-235 – Non-detect <0.027 pCi/L
 - c. U-238 – 0.53 pCi/L

"F" well: Drilling at F well was completed 3-8-07.

- 1) The Pomona Basalt formation was encountered at 377.8' bgs.
- 2) The bottom of the Elephant Mountain Basalt Formation was encountered at 316' bgs.
- 3) Three sediment samples were collected at the following intervals: 318-320', 341-343.5' and 362.4'-364.4'.
- 4) Three groundwater samples were collected at the following intervals: 325', 346.2', and 377.8'.
- 5) Gross beta results were reported as follows: 0.700 pCi/ml at 325' bgs and 1.10 pCi/ml at 346.2' bgs.
- 6) The counting error for both samples was approximately as high as the reported value, 0.840 pCi/ml and 0.847 pCi/ml.
- 7) The well screen was placed from 316' to 331' bgs.

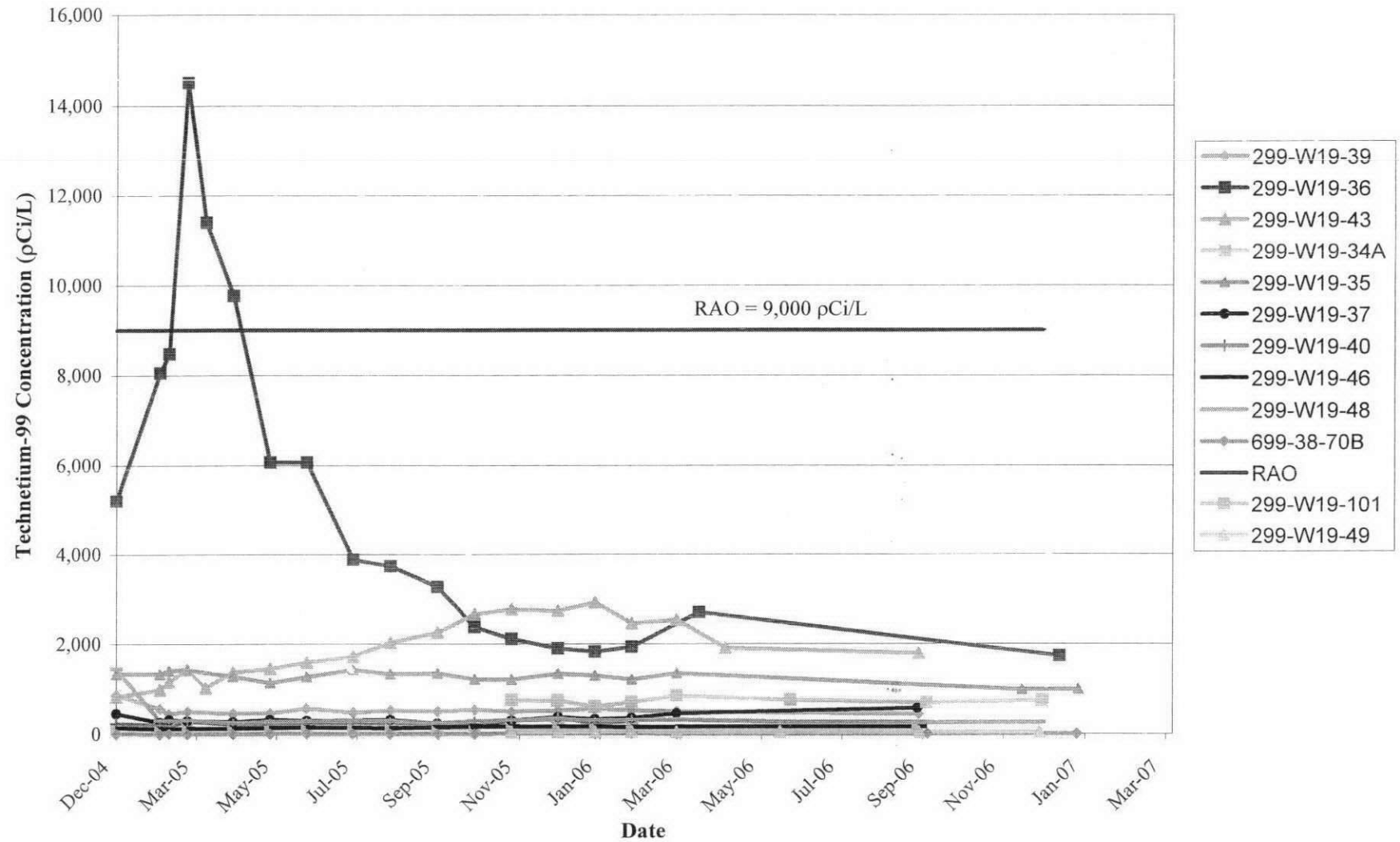
Work Plan: The work plan is on schedule. FH has delivered Draft A to DOE Monday March 12.

HRR: Field work is on going.

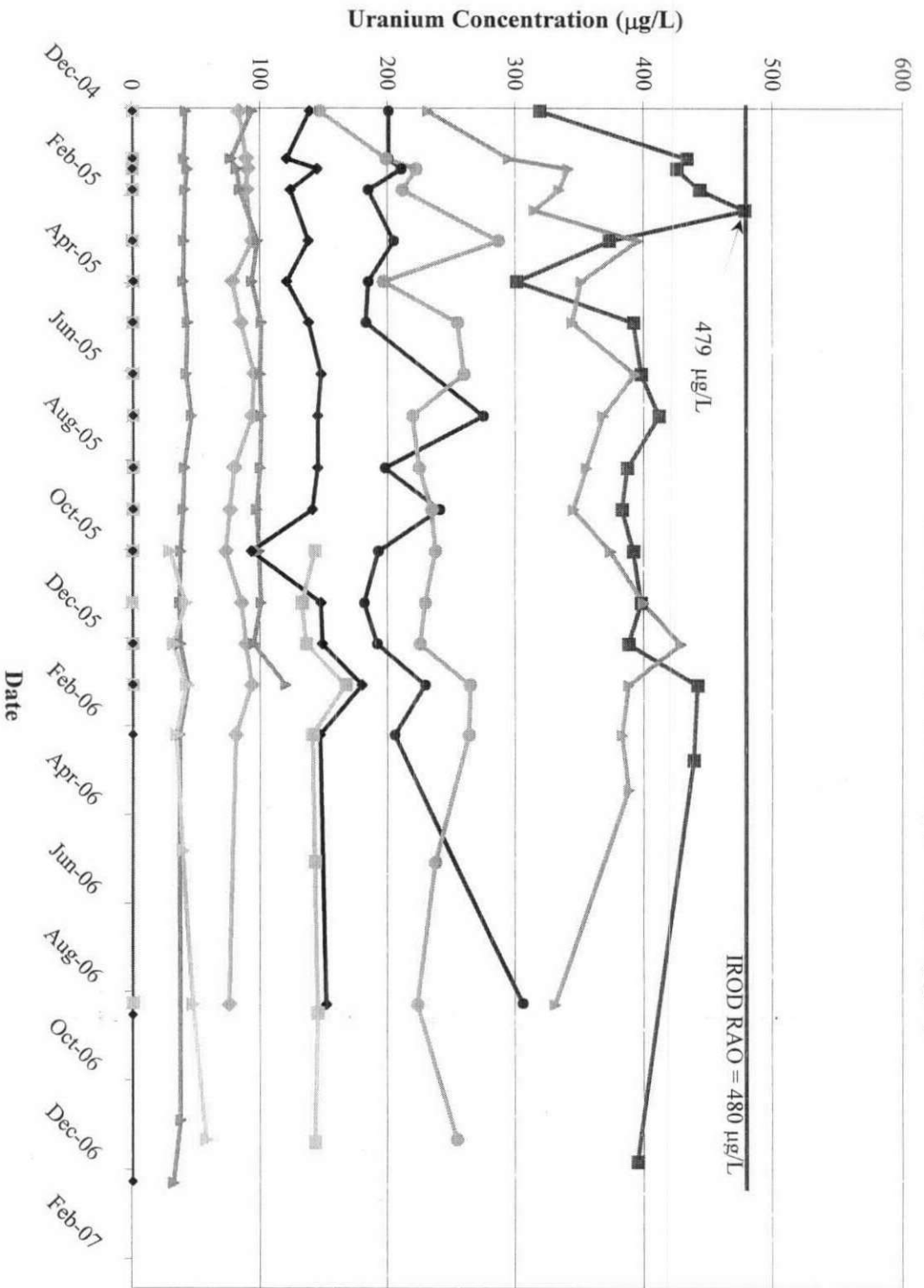
Sixty-five percent of the transects have been completed in the B/BX/BY WMA and surrounding waste sites (see Figure 5, **Attachment 17**).

Well to well surveys were completed over the weekend of March 10th and 11th.

200-UP-1, Rebound Study, Technetium-99 (pCi/L)

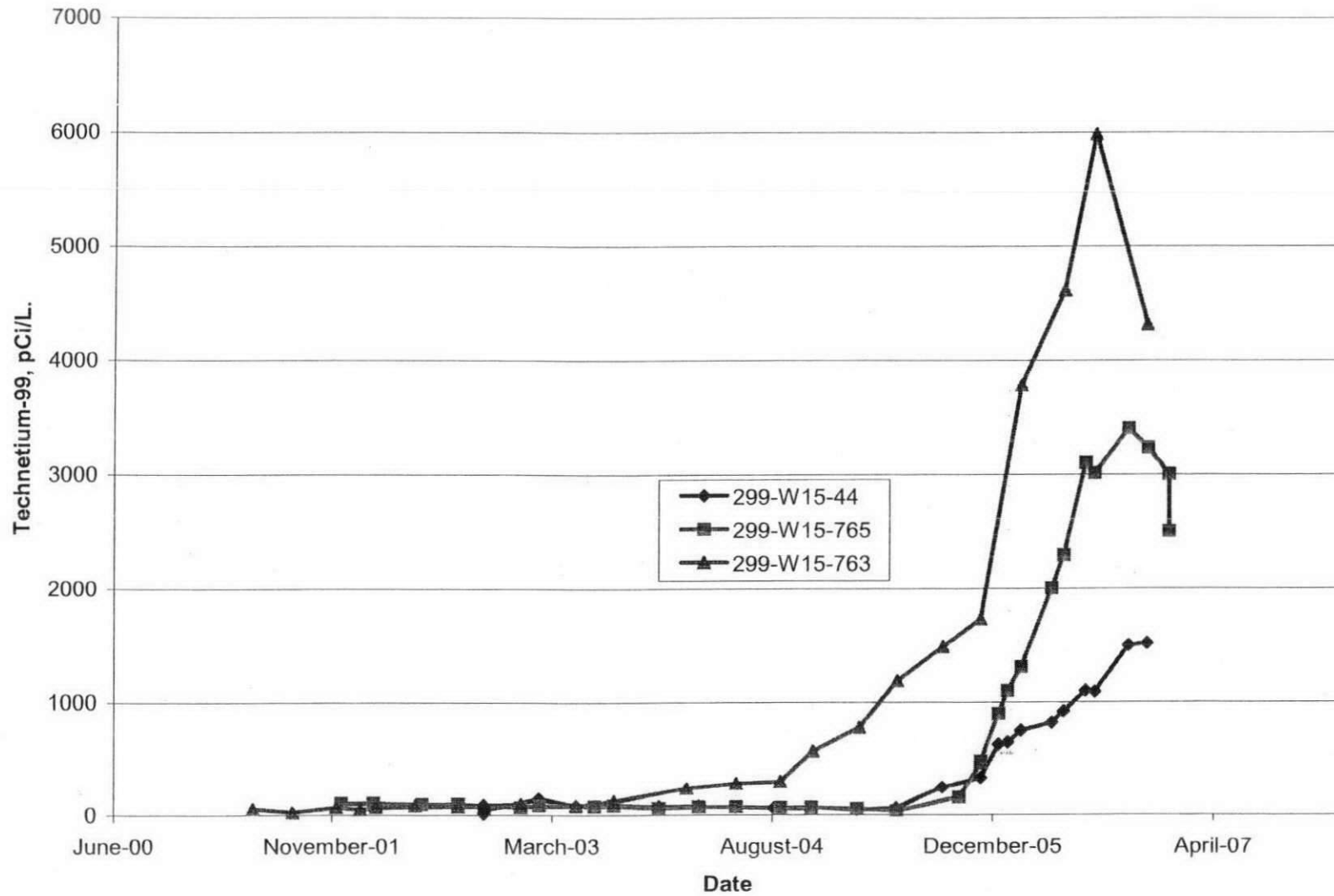


200-UP-1, Rebound Study, Uranium ($\mu\text{g/L}$)



- 299-W19-39
- 299-W19-36
- 299-W19-43
- 299-W19-34A
- 299-W19-35
- 299-W19-37
- 299-W19-40
- 299-W19-46
- 299-W19-48
- 699-38-70B
- RAO
- 299-W19-49
- 299-W19-101

Technetium-99 at Extraction Wells 299-W15-44 and 299-W15-765

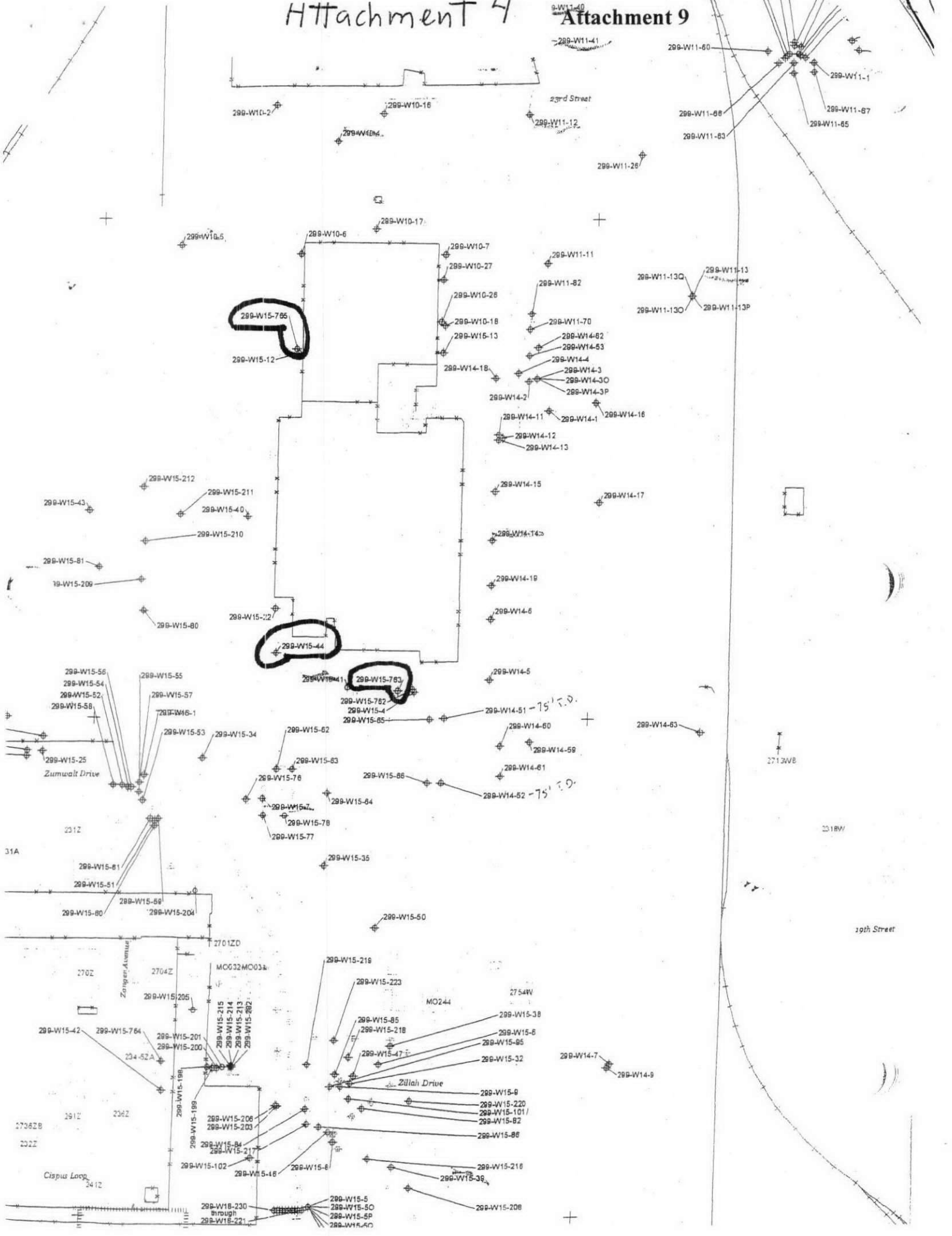


Attachment 3

Attachment 8

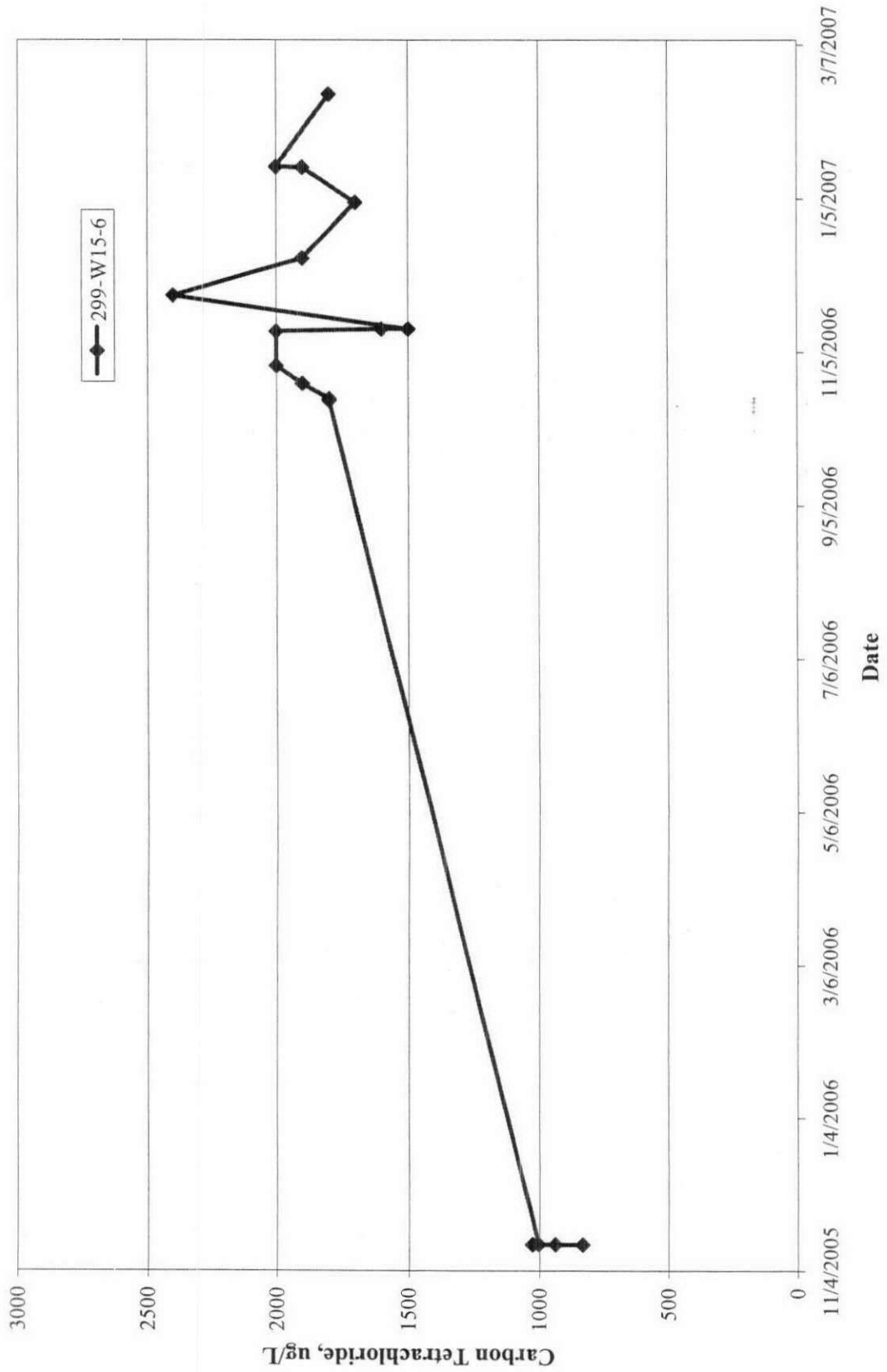
Attachment 4

Attachment 9



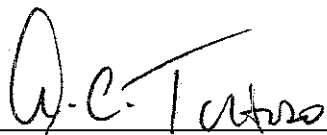
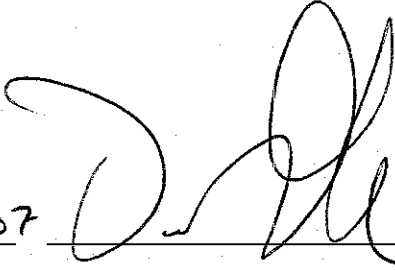
Attachment 5

299-W15-6



APPROVAL OF THE CARBON TETRACHLORIDE EXPEDITED RESPONSE ACTION
SOIL VAPOR EXTRACTION SYSTEM OPERATING PLAN FOR FY 2007

The Unit Managers for the Carbon Tetrachloride Expedited Response Action (200-PW-1 Operable Unit) approve the attached FY 2007 Soil Vapor Extraction System Operating Plan.

	
<u>3/15/07</u>	<u>3/15/07</u>
A. C. Tortoso	Date D. A. Faulk
U.S. Department of Energy	U.S. Environmental Protection Agency
Richland Operations Office	Region 10, Hanford Office

FY 2007 SOIL VAPOR EXTRACTION SYSTEM OPERATING PLAN FOR THE
CARBON TETRACHLORIDE EXPEDITED RESPONSE ACTION
(200-PW-1 OPERABLE UNIT)

Soil vapor extraction will be used at the 200-PW-1 Operable Unit (OU) during FY 2007 to remove carbon tetrachloride from the vadose zone. The primary objectives for this remediation are protection of the groundwater and mass removal. Only the 14.2 m³/min soil vapor extraction (SVE) system will be operated. Two sites will be remediated using SVE: the 216-Z-9 (Z-9) site and the 216-Z-1A/Z-18/Z-12 (Z-1A) site. Specific on-line wells have been selected prior to start-up at each site based on vapor monitoring, previous concentration trends, and location. These site-specific plans are included in this operating plan for approval by the Unit Managers prior to implementation. Based on characterization data collected at on-line wells during operation, the mix of on-line wells may be reconfigured during operations to optimize removal. These adjustments to the mix of on-line wells will not be submitted to the Unit Managers for approval prior to implementation but will be reported at Unit Manager Meetings. Ongoing passive soil vapor extraction will be maintained at Z-1A wells.

Soil vapor monitoring will be conducted at vadose zone locations near the groundwater, the Cold Creek unit (formerly called the Plio-Pleistocene layer), and the ground surface at the Z-1A and Z-9 sites while they are not being actively remediated using SVE. The soil vapor monitoring plan for both sites from April 2007 through September 2007 is included with this operating plan for approval prior to implementation. Monitoring results will be reported at the Unit Manager Meetings. If carbon tetrachloride vapor concentrations increase such that the carbon tetrachloride contamination may impact human health or the environment (including groundwater), the Unit Managers will decide on the appropriate response to mitigate the problem (e.g., relocating the vapor extraction system to address the problem).

The anticipated schedule for SVE operations and soil vapor monitoring is:

April 2007 through June 2007:	Operate the SVE system at the Z-9 site Monitor soil vapor concentrations at the Z-1A site
July 2007 through September 2007:	Operate the SVE system at the Z-1A site Monitor soil vapor concentrations at the Z-9 site

SOIL VAPOR EXTRACTION SYSTEM OPERATING PLAN AT THE
216-Z-9 SITE
April 2007 – June 2007

Twenty-seven wells at the 216-Z-9 site (Z-9 site) are identified for potential vapor extraction (Table 1). Selected wells will be prepared for potential hook-up to the soil vapor extraction system during April through June 2007.

The last non-operational soil vapor monitoring at Z-9 prior to SVE restart will take place in mid to late March 2007. At that time, any sampling tubes will be removed from potential on-line wells. The current wellhead assemblies (configured for non-operational soil vapor monitoring) will not be disturbed until the monitoring has been completed and the tubing removed.

For initial start-up operations at Z-9, extraction will be implemented at four planned intervals: 299-W15-217, 299-W15-82, 299-W15-9U, and 299-W15-9L (Table 1) (Figure 1). Start-up operations at Z-9 in FY 1998, FY 1999, FY 2001, FY 2002, FY 2004, and FY2006 were also initiated using these four extraction intervals. (A slightly different set of initial wells was used in FY 2005). Selecting the same set of initial wells will allow the rebound in FY 2007 to be compared to the rebound in previous years. (The SVE system was not operated at the Z-9 site during FY2003 to avoid interfering with the characterization sampling to be conducted during drilling of well 299-W15-46.)

These four intervals will be characterized on the first day they are placed into operation. During continued operations, all on-line wells will be characterized each week and all off-line wells, if requested, will be characterized during the 2nd, 4th, 6th, 8th, 10th, and final weeks, according to the attached sampling and analysis plan (Table 2). The mix of on-line wells will be periodically changed during operations, based on changing concentrations, extraction interval locations, and operating experience. In general, the initial extraction wells will be nearer the carbon tetrachloride source (Z-9 Trench) and wells added later will expand operations away from this source.

The Z-9 slant well (299-W15-48), which was completed and placed on-line in FY 2006, will be prioritized for use in FY 2007. Three narrow-diameter wells [C4937 (P66D), C4938 (P69C), and C5340 (P68C)], which were installed south of Z-9 in FY2007, also will be prioritized for use in FY2007.

The 200-PW-1 OU technical lead organizes and maintains spreadsheets of the characterization data on a desktop computer. The characterization data are included in the annual performance evaluation report.

SOIL VAPOR EXTRACTION SYSTEM OPERATING PLAN AT THE
216-Z-1A, 216-Z-18, AND 216-Z-12 SITE
July 2007 – September 2007

Twenty-six wells at the 216-Z-1A, 216-Z-18, and 216-Z-12 site (Z-1A site) are identified for potential soil vapor extraction (Table 3). Selected wells will be prepared for potential hook-up to the soil vapor extraction system during July through September 2007.

The last non-operational soil vapor monitoring at Z-1A prior to SVE restart will take place in mid to late June 2007. At that time, any sampling tubes will be removed from potential on-line wells. The current wellhead assemblies (configured for non-operational soil vapor monitoring) will not be disturbed until the monitoring has been completed and the tubing removed.

Passive soil vapor extraction is being conducted at the following Z-1A wells with lower intervals open between the Cold Creek unit and groundwater: 299-W18-6L, 299-W18-7, 299-W18-10L, 299-W18-11L, 299-W18-12, 299-W18-246L, 299-W18-247L, and 299-W18-252L (Table 4).

For initial start-up operations at Z-1A, extraction will be implemented at five planned intervals in the Z-1A tile field: 299-W18-165, 299-W18-166, 299-W18-167, 299-W18-168, and 299-W18-174 (Table 3) (Figure 1). Start-up operations in FY 2001, FY 2002, FY 2003, FY 2004, and FY 2005 were also initiated using these five extraction intervals (a sixth interval selected in FY 2001 produced virtually no flow). In FY 2006, start-up operations were initiated using three of these wells. Selecting the same set of initial wells will allow the rebound in FY 2007 to be compared to the rebound in previous years.

These five intervals will be characterized on the first day of operations. During continued operations, all on-line wells will be characterized each week and all off-line wells, if requested, will be characterized during the 2nd, 4th, 6th, 8th, 10th, and final weeks, according to the attached sampling and analysis plan (Table 2). As before, the mix of on-line wells will be periodically changed during operations, based on changing concentrations, extraction interval locations, and operating experience. In general, the initial extraction wells will be nearer the primary carbon tetrachloride source (Z-1A Tile Field) and wells added later will expand operations away from this source.

The 200-PW-1 OU technical lead organizes and maintains spreadsheets of the characterization data on a desktop computer. The characterization data are included in the annual performance evaluation report.

VADOSE ZONE MONITORING PLAN FOR SOIL VAPOR EXTRACTION SITES

April 2007 – September 2007

Non-Operational Monitoring and Passive Soil Vapor Extraction Monitoring

This plan describes planned non-operational monitoring and passive soil vapor extraction monitoring to be conducted during April through September 2007 for the 200 West Area Carbon Tetrachloride Expedited Response Action (200-PW-1 Operable Unit). Non-operational monitoring will be conducted at the 216-Z-1A/Z-18/Z-12 (Z-1A) site during April through June 2007 while the soil vapor extraction (SVE) system is operating at the 216-Z-9 (Z-9) site. Non-operational monitoring will be conducted at the Z-9 site during July through September 2007 while the SVE system is operating at the Z-1A site. Passive soil vapor extraction monitoring will be conducted at the Z-1A site from April 2007 through September 2007.

Scope: Monitor carbon tetrachloride soil vapor concentrations at selected probes and wells during non-operation of the soil vapor extraction (SVE) system (Tables 5 and 6). At any particular time, all of the probes and some of the wells will be “non-operational,” i.e., they will not be connected to the SVE system. Eight of the non-operational wells have a passive soil vapor extraction system installed at the wellhead.

Passive soil vapor extraction is a remediation technology that uses naturally induced pressure gradients between the subsurface and the surface to drive soil vapor to the surface. In general, falling atmospheric pressure causes subsurface vapor to move to the atmosphere through wells, while rising atmospheric pressure causes atmospheric air to move into the subsurface. The passive soil vapor extraction systems will be used to remove carbon tetrachloride from the vadose zone.

Passive extraction wells will vent through aboveground canisters containing granular activated carbon (GAC). The wells will be monitored monthly using the sampling method used for the non-operational wells. The carbon tetrachloride vapor concentration will be monitored both upstream and downstream of the GAC. The measured vapor concentrations will be used to estimate the amount of carbon tetrachloride extracted through each well during the month.

For monitoring the non-operational probes and wells and the passive extraction wells, the components of this scope are:

- Collect soil vapor samples in accordance with GRP-EE-01-5.1
- Analyze soil vapor samples for carbon tetrachloride using the B&K field screening instrument in accordance with GRP-EE-05-4.0 at field screening level QC-1 (HNF-20635, Appendix B)
- Evaluate concentration trends for the Fluor Hanford Soil and Groundwater Remediation Project
- Report results to 200-PW-1 Operable Unit Managers
- Include results in annual reports

Purpose and Objectives: The purpose of non-operational monitoring is to measure carbon tetrachloride concentrations in the vadose zone during the shutdown of the SVE system.

The objectives of monitoring the non-operational wells and probes are (1) to measure carbon tetrachloride concentrations and trends near the vadose-atmosphere and vadose-groundwater interfaces to evaluate whether non-operation of the SVE system is negatively impacting the atmosphere or groundwater; and (2) to be cognizant of carbon tetrachloride concentrations and trends near the lower permeability Cold Creek unit to provide an indication of concentrations that can be expected during restart of SVE operations and to support selection of on-line wells.

The objectives of monitoring the passive soil vapor extraction system wells, which are all open near the vadose-groundwater interface, are: (1) to measure carbon tetrachloride concentrations and trends near the vadose-groundwater interface; and (2) to quantify the mass of carbon tetrachloride removed using this technology.

Duration: Non-operational monitoring and passive soil vapor extraction monitoring will be conducted from April 2007 through September 2007 during FY 2007.

Monitoring Frequency: Monitoring will be conducted monthly.

Monitoring Locations: Locations were selected to focus carbon tetrachloride monitoring near the vadose-atmosphere and vadose-groundwater interfaces and near the Cold Creek unit (Table 5). These monitoring locations may be revised by the 200-PW-1 OU task lead based on developing trends, accessibility, and/or recommendations of the sampler. The 200-PW-1 Operable Unit Managers will be advised of any changes to the monitoring locations. Monitoring locations are shown on Figures 2 and 3.

Data Management: The field screening data obtained from non-operational wells and probes and passive extraction wells are entered into a controlled field logbook, which is maintained by Lockheed Martin Services Inc (LMSI) Records Information Management (RIM) department. The 200-PW-1 OU technical lead organizes and maintains spreadsheets of the field screening data on a desktop computer. The field screening data are included in the annual performance evaluation report.

References:

GRP-EE-05-4.0, *Analysis of Volatile Organic Compounds in Vapor Samples Using the Bruel and Kjaer 1301 and Innova 1312 Multi-Gas Analyzers*, Fluor Hanford, Inc., Richland, Washington.

GRP-EE-01-5.1, *Soil-Gas Sampling*, Fluor Hanford, Inc., Richland, Washington.

HNF-20635, *Groundwater Remediation Project Quality Assurance Project Plan (GRP-QA-001)*, Appendix B, "Additional QA Requirements Specific to Onsite Measurement," Fluor Hanford, Inc., Richland, Washington.

Attachment 11, Figure 8

Table 1. Wells Available for Soil Vapor Extraction System Operations at the 216-Z-9 Site, April through June 2007

Potential On-Line Wells	Reason	Initial Wells
299-W15-6U	Mass removal	
299-W15-6L	Groundwater Protection	
299-W15-8U	Mass removal	
299-W15-8L	Groundwater Protection	
299-W15-9U	Mass removal	X
299-W15-9L	Groundwater Protection	X
299-W15-48	Mass Removal	
299-W15-82	Mass removal	X
299-W15-84U	Mass removal	
299-W15-84L	Mass removal	
299-W15-85	Mass removal	
299-W15-86	Mass removal	
299-W15-95U	Mass removal	
299-W15-95L	Mass removal	
299-W15-216U	Mass removal	
299-W15-216L	Groundwater Protection	
299-W15-217	Mass removal	X
299-W15-218U	Mass removal	
299-W15-218L	Groundwater Protection	
299-W15-219U	Mass removal	
299-W15-219L	Groundwater Protection	
299-W15-220U	Mass removal	
299-W15-220L	Groundwater Protection	
299-W15-223	Mass removal	
C4937 (P66D)	Mass removal	
C4938 (P69C)	Mass removal	
C5340 (P68C)	Mass removal	

Table 2. Sampling and Analysis Plan for Soil Vapor Extraction System Operations, April through September 2007

When to Monitor	on-line wells	off-line wells	vacuum wellhead	flow	CCl4	CHCl3	CH2Cl2	MEK
					carbon tetrachloride	chloroform	methylene chloride	MEK
first day of operations	X		X	X	X	X	X	X
beginning of 2nd week	X	X	X	X	X	X	X	X
beginning of 3rd week	X		X	X	X	X	X	X
beginning of 4th week	X	X	X	X	X	X	X	X
beginning of 5th week	X		X	X	X	X	X	X
beginning of 6th week	X	X	X	X	X	X	X	X
beginning of 7th week	X		X	X	X	X	X	X
beginning of 8th week	X	X	X	X	X	X	X	X
beginning of 9th week	X		X	X	X	X	X	X
beginning of 10th week	X	X	X	X	X	X	X	X
beginning of 11th week	X		X	X	X	X	X	X
beginning of 12th week	X		X	X	X	X	X	X
last day of operations	X	X	X	X	X	X	X	X
Fax copy of monitoring records to 200-PW-1 OU Technical Lead (Virginia Rohay at 373-3974) by close of day following monitoring.								

Table 3. Wells Available for Soil Vapor Extraction System Operations at the 216-Z-1A/Z-18/Z-12 Site, July through September 2007

Potential On-Line Wells	Reason	Initial Wells
299-W18-6U	Mass removal	
299-W18-89	Mass removal	
299-W18-93	Mass removal	
299-W18-94	Mass removal	
299-W18-96	Mass removal	
299-W18-97	Mass removal	
299-W18-98	Mass removal	
299-W18-99	Mass removal	
299-W18-152	Mass removal	
299-W18-153	Mass removal	
299-W18-157	Mass removal	
299-W18-158L	Mass removal	
299-W18-159	Mass removal	
299-W18-163L	Mass removal	
299-W18-165	Mass removal	X
299-W18-166	Mass removal	X
299-W18-167	Mass removal	X
299-W18-168	Mass removal	X
299-W18-169	Mass removal	
299-W18-171L	Mass removal	
299-W18-174	Mass removal	X
299-W18-246U	Mass removal	
299-W18-247U	Mass removal	
299-W18-248	Mass removal	
299-W18-249	Mass removal	
299-W18-252U	Mass removal	

Table 4. Passive Soil Vapor Extraction Wells at the 216-Z-1A/Z-18/Z-12 Site, FY 2007

Passive Soil Vapor Extraction Wells	Reason
299-W18-6L	Groundwater Protection
299-W18-7	Groundwater Protection
299-W18-10L	Groundwater Protection
299-W18-11L	Groundwater Protection
299-W18-12	Groundwater Protection
299-W18-246L	Groundwater Protection
299-W18-247L	Groundwater Protection
299-W18-252L	Groundwater Protection

Table 5a. Distribution of Selected Monitoring Locations During Soil Vapor Extraction System Operations at the 216-Z-9 Site, April through June 2007

Target Zone	Number of Monitoring Locations		
	Z-1A	Z-9	Total
Near-surface (3-25 m below ground surface)	11	3	14
Cold Creek (25-45 m below ground surface)	6	2	8
Groundwater (50-65 m below ground surface)	8 ^a	0	8
Total	25	5	30

^a Eight available monitoring locations near the vadose/groundwater interface in the Z-1A area are being monitored as part of the passive soil vapor extraction system network.

Table 5b. Distribution of Selected Monitoring Locations During Soil Vapor Extraction System Operations at the 216-Z-1A/Z-18/Z-12 Site, July through September 2007

Target Zone	Number of Monitoring Locations		
	Z-1A	Z-9	Total
Near-surface (3-25 m below ground surface)	5	9	14
Cold Creek (25-45 m below ground surface)	0	8	8
Groundwater (50-65 m below ground surface)	8 ^a	5	13
Total	13	22	35

^a Eight available monitoring locations near the vadose/groundwater interface in the Z-1A area are being monitored as part of the passive soil vapor extraction system network.

Table 6a. Non-Operational Wells and Probes Selected for Monitoring During Soil Vapor Extraction System Operations at the 216-Z-9 Site, April through June 2007

Target Zone	Z-9	Depth (m)	Comment	Z-1A	Depth (m)	Comment
near-surface	CPT-28 40 ft (blue)	12	farfield south of Z-9	CPT-32 25 ft (green)	8	west of Z-1A
near-surface	CPT-21A 45 ft (green)	14	south of Z-9	CPT-4E 25 ft (white)	8	north central in Z-1A/Z-18/Z-12 field
near-surface	CPT-9A 60 ft (blue)	18	farfield north of Z-9	CPT-30 28 ft (green)	9	north of Z-18 (middle of Z-1A/Z-18/Z-12 field)
near-surface				CPT-13A 30 ft (blue)	10	southeast of Z-1A
near-surface				CPT-7A 32 ft (yellow)	10	farfield northeast of Z-1A
near-surface				CPT-1A 35 ft (black)	11	west of Z-12
near-surface				CPT-33 40 ft (green)	12	between Z-18 and Z-12
near-surface				CPT-34 40 ft (green)	12	west of Z-18
near-surface				CPT-C3872 62.5 ft	19	east side of Z-1A
near-surface				CPT-1A 68 ft (yellow)	21	west of Z-12
near-surface				CPT-32 70 ft (red)	21	west of Z-1A
Cold Creek	CPT-21A 86 ft (red)	26	south of Z-9	299-W18-152	31	northwest corner of Z-12
Cold Creek	CPT-28 87 ft (red)	27	farfield south of Z-9	299-W18-167	32	within Z-1A
Cold Creek				CPT-4F 109 ft (red)	33	north central in Z-1A/Z-18/Z-12 field
Cold Creek				299-W18-165	33	within Z-1A
Cold Creek				299-W18-249	40	northeast corner of Z-18
Cold Creek				299-W18-248	40	east side of Z-1A
ground-water				299-W18-247L*	51	southeast of Z-18
ground-water				299-W18-246L*	52	west of Z-1A
ground-water				299-W18-252L*	53	middle of Z-1A/Z-18/Z-12 field
ground-water				299-W18-10L*	55	east side of Z-18
ground-water				299-W18-7*	60	east side of Z-1A
ground-water				299-W18-11L*	60	within Z-18
ground-water				299-W18-12*	60	within Z-18
ground-water				299-W18-6L*	63	west side of Z-1A

* Passive soil vapor extraction wells

Note: Colors refer to the color coding on the soil vapor probe tubing.

Table 6b. Non-Operational Wells and Probes Selected for Monitoring During Soil Vapor Extraction System Operations at the 216-Z-1A/Z-18/Z-12 Site, July through September 2007

Target Zone	Z-9	Depth (m)	Comment	Z-1A	Depth (m)	Comment
near-surface	CPT-17 10 ft (blue)	3	southwest of Z-9	CPT-4E 25 ft (white)	8	north central in Z-1A/Z-18/Z-12 field
near-surface	CPT-18 15 ft (white)	5	northwest of Z-9	CPT-13A 30 ft (blue)	10	southeast of Z-1A
near-surface	CPT-16 25 ft (blue)	8	east of Z-9	CPT-7A 32 ft (yellow)	10	farfield northeast of Z-1A
near-surface	CPT-27 33 ft (red)	10	southeast of Z-9	CPT-1A 35 ft (black)	11	west of Z-12
near-surface	CPT-9A 60 ft (blue)	18	farfield north of Z-9	CPT-34 40 ft (green)	12	west of Z-18
near-surface	CPT-16 65 ft (red)	20	east of Z-9			
near-surface	CPT-21A 65 ft (green)	20	south of Z-9			
near-surface	CPT-24 70 ft (green)	21	northwest of Z-9			
near-surface	CPT-18 75 ft (red)	23	northwest of Z-9			
Cold Creek	299-W15-82	25	east side of Z-9			
Cold Creek	CPT-21A 86 ft (red)	26	south of Z-9			
Cold Creek	CPT-28 87 ft (red)	27	farfield south of Z-9			
Cold Creek	299-W15-8U	31	southside of Z-9			
Cold Creek	299-W15-217	35	southwest corner of Z-9			
Cold Creek	CPT-24 118 ft (red)	36	northwest of Z-9			
Cold Creek	299-W15-220 SST/118 ft (red)	36	east of Z-9			
Cold Creek	299-W15-95L	44	north side of Z-9			
ground-water	299-W15-220L 163 ft	50	east of Z-9	299-W18-247L*	51	southeast of Z-18
ground-water	299-W15-219L 175 ft	53	northwest of Z-9	299-W18-246L*	52	west of Z-1A
ground-water	299-W15-84L 180 ft	55	west of Z-9	299-W18-252L*	53	middle of Z-1A/Z-18/Z-12 field
ground-water	299-W15-9L	57	11 m from 299-W15-32 extraction well	299-W18-10L*	55	east side of Z-18
ground-water	299-W15-46	66	southside of Z-9	299-W18-7*	60	east side of Z-1A
ground-water				299-W18-11L*	60	Within Z-18
ground-water				299-W18-12*	60	Within Z-18
ground-water				299-W18-6L*	63	west side of Z-1A

* Passive soil vapor extraction wells

Note: Colors refer to the color coding on the soil vapor probe tubing.

Figure 1. Location of Extraction and Monitoring Wells at the 216-Z-1A/Z-18/Z-12 and 216-Z-9 Sites

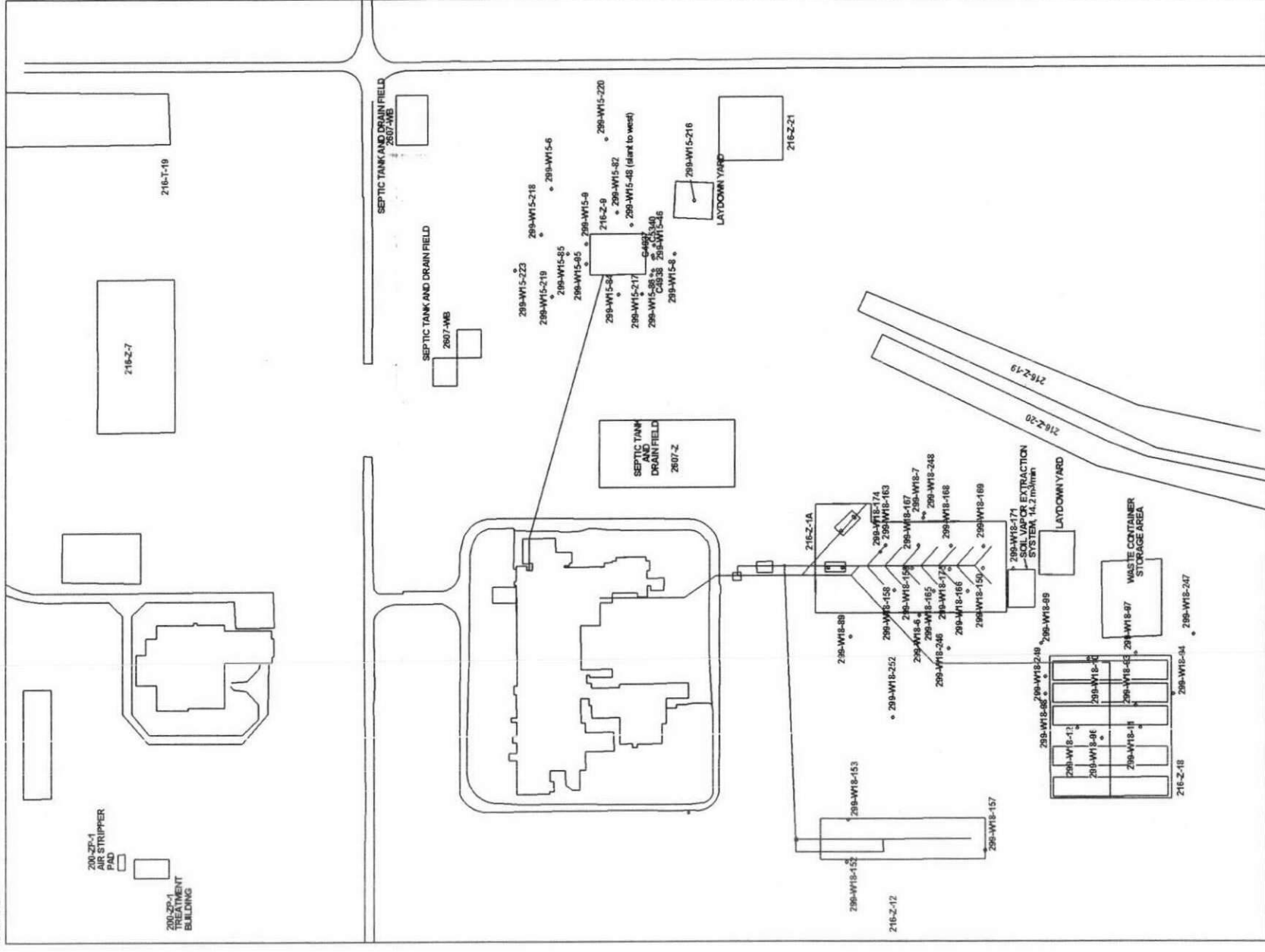
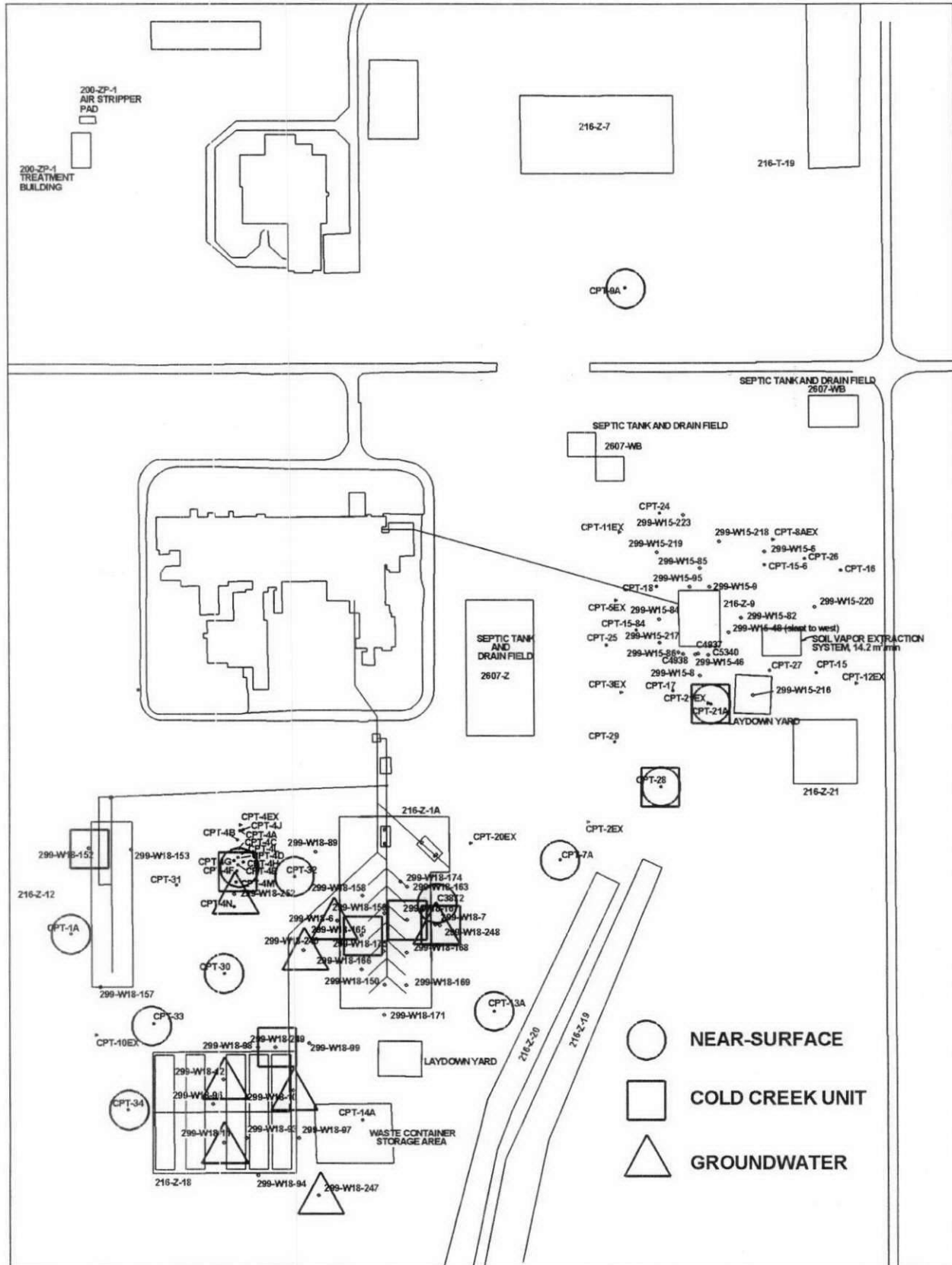
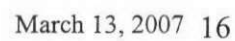


Figure 2. Location of Wells and Probes Selected for Non-Operational Monitoring and Passive Soil Vapor Extraction Monitoring, April through June 2007





Attachment 12, Figure 1

Comparison of Maximum Carbon Tetrachloride Rebound Concentrations
Monitored at 200-PW-1 Soil Vapor Extraction Sites
FY 2003 - FY 2007

200-PW-1	July 2002 (Z-9) or October 2003 (Z-1A) - March 2004	July 2002 (Z-9) or April 2004 (Z-1A) - September 2004	October 2004 - June 2005	July 2005 - June 2006	July 2006 - February 2007
Location (Well or Probe) /feet bgs	Site Maximum Rebound Carbon Tetrachloride (ppmv)	Maximum Rebound Carbon Tetrachloride (ppmv)	Maximum Rebound Carbon Tetrachloride (ppmv)	Maximum Rebound Carbon Tetrachloride (ppmv)	Maximum Rebound Carbon Tetrachloride (ppmv)
79-03/ 5 ft	Z-18				
79-06/ 5 ft	Z-1A				
79-11/ 5 ft	Z-1A				
86-05/ 5 ft	Z-9				
86-05-01/ 5 ft	Z-9				
86-06/ 5 ft	Z-9				
87-05/ 5 ft	Z-1A				
87-09/ 5 ft	Z-1A				
94-02/ 5 ft	Z-9				
95-11/ 5 ft	Z-9				
95-12/ 5 ft	Z-9				
95-14/ 5 ft	Z-9				
CPT-13A/ 9 ft	Z-1A				
CPT-16/ 10 ft	Z-9	9.0	11.4	2.5	1.6
CPT-17/ 10 ft	Z-9	2.4	3.1	0	5
CPT-18/ 15 ft	Z-1A				
CPT-4A/ 25 ft	Z-1A				
CPT-27/ 15 ft	Z-9				
CPT-4E/ 25 ft	Z-1A	2.4	2.4	2.4	0
CPT-16/ 25 ft	Z-9	3.6	4.4	1.6	1.0
CPT-31/ 25 ft	Z-12				
CPT-32/ 25 ft	Z-1A	5.9	8.6	6.4	6.0
CPT-30/ 28 ft	Z-18	0	1.6	1.2	0
CPT-13A/ 30 ft	Z-1A	1.8	8.3	4.1	5.8
CPT-7A/ 32 ft	Z-1A	9.5	4.4	3.8	3.4
CPT-27/ 33 ft	Z-9	2.7	8.4	1.8	12
CPT-1A/ 35 ft	Z-12	18.3	14.0	17.2	13.4
CPT-18/ 35 ft	Z-9				0
CPT-28/ 40 ft	Z-9		5.4		5.5
CPT-33/ 40 ft	Z-18		3.9		1.6
CPT-34/ 40 ft	Z-18		3.0	2.0	1.3
CPT-21A/ 45 ft	Z-9	1.8	7.9		4.2
CPT-30/ 48 ft	Z-18				8
W15-220S17/ 52 ft	Z-9				
CPT-9A/ 60 ft	Z-9	35.9	32.4	29.2	16.2
CPT-28/ 60 ft	Z-1A		88.3		5
CPT-C3872/ 63 ft	Z-1A		15.5	9.9	12.2
CPT-16/ 65 ft	Z-9	4.2	6.7	5.6	0
CPT-21A/ 65 ft	Z-9	150	170	167	163
CPT-1A/ 68 ft	Z-12		13.7		13.2
CPT-30/ 68 ft	Z-18				3
CPT-13A/ 70 ft	Z-1A				
CPT-24/ 70 ft	Z-9	9.1		5.2	
CPT-32/ 70 ft	Z-1A		5.5	12	4.3
W15-219SS17/ 70 ft	Z-9	5.7			3
CPT-4A/ 75 ft	Z-1A				
CPT-18/ 75 ft	Z-9	8.3		4.3	
CPT-31/ 76 ft	Z-12				
CPT-33/ 80 ft	Z-18				
W15-32/ 85 ft	Z-9	85.8			
CPT-21A/ 86 ft	Z-9	244	95.8	8.1	3.9
CPT-34/ 86 ft	Z-18		209	223	194
W15-96J/ 86 ft	Z-9				5
W15-219SS17/ 86 ft	Z-9				
CPT-28/ 87 ft	Z-9	258	246	245	216
CPT-4B/ 90 ft	Z-1A				5
CPT-1A/ 91 ft	Z-12				
CPT-4A/ 91 ft	Z-1A				
CPT-34/ 91 ft	Z-9				
W15-85/ 91 ft	Z-9				
W18-252SS17/ 100	Z-1A				
W18-152/ 101 ft	Z-12	12.4	16.0	16.2	16.3
W15-8U/ 103 ft	Z-9			10.4	14.1
CPT-4E/ 103 ft	Z-1A				5
W18-167/ 106 ft	Z-1A	266	196	174	3.0
CPT-4F/ 109 ft	Z-1A				8
W18-165/ 109 ft	Z-1A		11.9	394	2.9
W15-217/ 114 ft	Z-9	205	35.2	6	2.5
CPT-24/ 118 ft	Z-9	458	374	19.7	16.5
W15-220S17/ 118	Z-9			23.9	5
W18-158U/ 120 ft	Z-1A			25.2	
W15-219SS17/ 130	Z-9				
W18-249/ 130 ft	Z-18	41.0	64.9	24.1	19.7
W18-248/ 131 ft	Z-9	180	249	67.0	131.0
W15-96J/ 144 ft	Z-9	40.3	26.7	26.7	18.0
W15-219SS17/ 155	Z-9				5
W15-220U/ 163 ft	Z-9				
W15-219U/ 175 ft	Z-9				
W15-9U/ 176 ft	Z-9	13.1	23.0	13.2	
W15-84J/ 180 ft	Z-9	25.9	13.1	12.2	7.9
W15-6L/ 182 ft	Z-9	25.9	23.0	5.4	5
W15-220S17/ 185	Z-9			14.0	
W18-77/ 197 ft	Z-1A				
W18-12/ 198 ft	Z-18				
W18-6U/ 208 ft	Z-1A				
W15-46/ 217 ft	Z-9			4.7	5.7
				12	5

* - based on location (Z-1A/18/12 or Z-9) of monitoring point; specific points may be beyond SVE zone of influence during particular operating configurations
 - Z-18 and Z-12 wells off-line Oct 96 - Apr 98
 - CPT-1A, CPT-9A, and possibly CPT-7A appeared to be beyond SVE zone of influence in Oct 96 based on differential pressure (BHI-01105, p. 6-1)
 - CPT-6A, CPT-21A, CPT-28 beyond SVE zone of influence in May 96 based on CCI4 concentrations and airflow modeling based on measured vacuums (BHI-01105, p. 6-1)

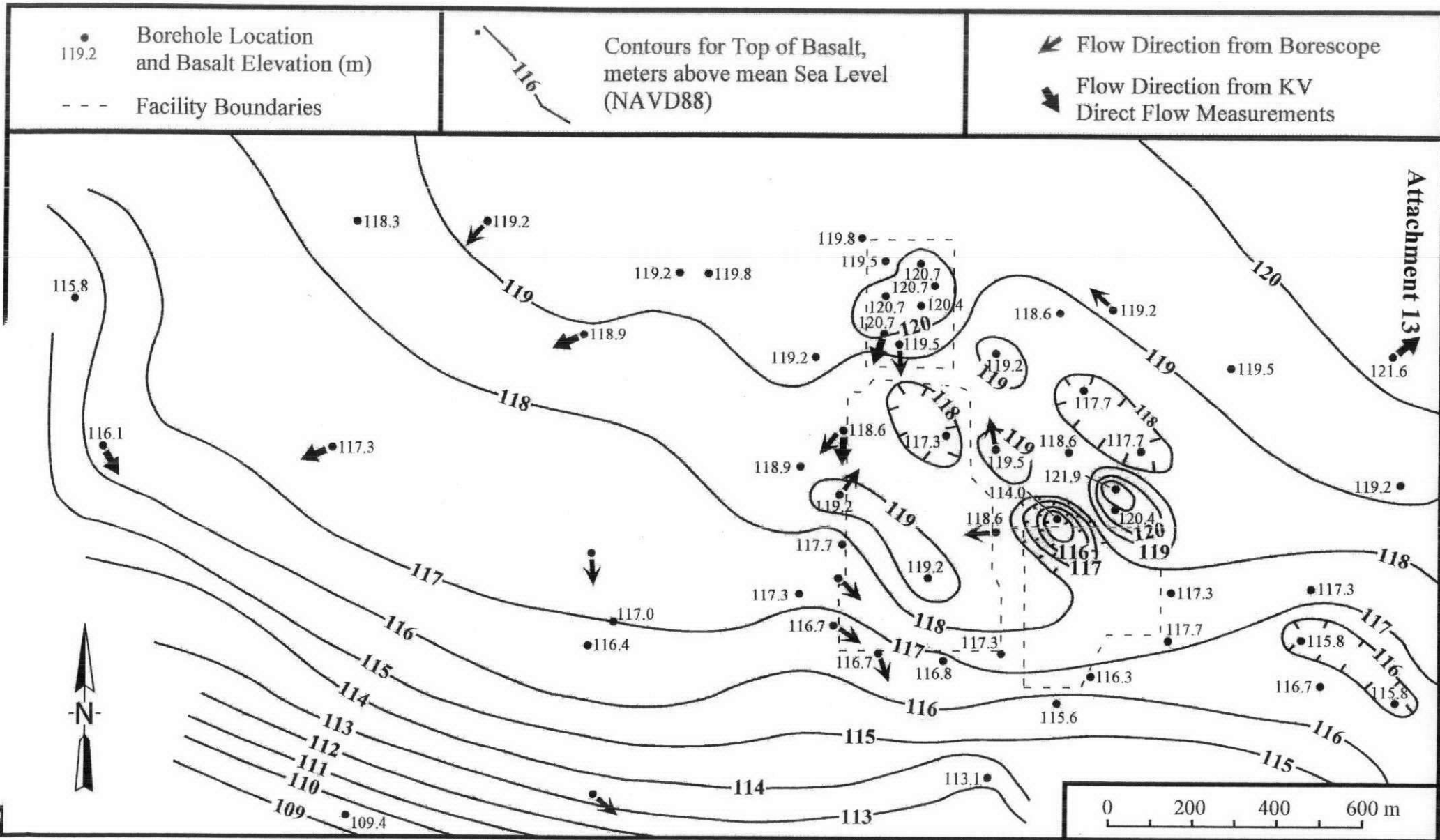
Carbon Tetrachloride Rebound Concentrations
Monitored at 200-PW-1 Soil Vapor Extraction Sites
January 2006 - February 2007

200-PW-1		01/26/2006	02/23/2006	03/28/2006	04/28/2006	05/26/2006	06/29/2006	07/26/2006	08/30/2006	09/26/2006	10/25/2006	11/30/2006	12/19/2006	01/31/2007	02/27/2007
Location (Well or Probe) /feet bgs	Site	CCI4 (ppmv)	CCI4 (ppmv)	CCI4 (ppmv)	CCI4 (ppmv)	CCI4 (ppmv)	CCI4 (ppmv)	CCI4 (ppmv)	CCI4 (ppmv)	CCI4 (ppmv)	CCI4 (ppmv)	CCI4 (ppmv)	CCI4 (ppmv)	CCI4 (ppmv)	CCI4 (ppmv)
CPT-17/ 10 ft	Z-9	1.3	1.5	1.7	2.0	2.2	2.3				1.2	1.2	1.2	1.4	1.6
CPT-18/ 15 ft	Z-9	0	0	0	0	0	0								
CPT-27/ 15 ft	Z-9										0	0	0	0	0
CPT-4E/ 25 ft	Z-1A				2.4	1.7	0	0	0	0					
CPT-16/ 25 ft	Z-9	1.1	1.1	1.1	1.0	0	0				0	1.0	0	0	1.0
CPT-32/ 25 ft	Z-1A	4.0	4.6	6.4				0	0	0	0	1.2	2.1	3.4	6.0
CPT-30/ 28 ft	Z-1A	0	0	0				0	0	0					
CPT-13A/ 30 ft	Z-1A	3.6	3.5	3.3	3.6	3.8	3.3	2.4	2.5	2.4	3.3	2.9	5.8	1.6	5.0
CPT-7A/ 32 ft	Z-1A	2.8	3.3	3.8	2.4	2.4	1.8	2.0	1.9	1.2	1.9	2.5	2.6	3.2	3.4
CPT-27/ 33 ft	Z-9	0	0	0	0	0	0								
CPT-1A/ 35 ft	Z-12	7.7	6.0	7.4	6.2	8.9	13.2	11.0	13.4	10.2	10.0	4.6	5.1	4.4	7.3
CPT-18/ 35 ft	Z-9										0	0	0	0	0
CPT-28/ 40 ft	Z-9							5.5	4.3	4.8					
CPT-33/ 40 ft	Z-18							0	1.3	1.6					
CPT-34/ 40 ft	Z-18				1.3	1.7	1.2	0	1.3	1.3					
CPT-21A/ 45 ft	Z-9														
CPT-30/ 48 ft	Z-9										0	4.2	3.1	2.9	1.5
CPT-9A/ 50 ft	Z-9	48.1	50.4	46.1	46.9	49.0	39.1	32.8	40.7	43.3	30.6	42.6	42.0	43.7	39.5
CPT-9A/ 60 ft	Z-9	17.4	11.4	16.0	17.3	24.4	13.3	12.8	9.8	15.7	14.2	16.2	13.1	13.2	7.2
CPT-28/ 60 ft	Z-9														
CPT-C3872 / 63 ft	Z-1A	5.1	6.3	9.9				2.1	2.2	2.4	3.5	5.5	6.1	7.8	12.2
CPT-9A/ 64 ft	Z-9	33.4	36.2	36.6	33.1	36.4	33.1	33.8	33.8	33.9	28.1	32.3	28.9	16.7	29.9
CPT-16/ 65 ft	Z-9				5.3	5.6	4.6								
CPT-21A/ 65 ft	Z-9	139	146	145	139	160	137	153	132	137	123	120	123	127	138
CPT-1A/ 68 ft	Z-12							13.2	12.5	5.6					
CPT-24/ 70 ft	Z-9				4.4	5.2	4.3								
CPT-32/ 70 ft	Z-1A							4.2	4.3	3.5					
W15-219SST/ 70 ft	Z-9														
CPT-18/ 75 ft	Z-9				3.4	3.7	4.3								
W15-82/ 83 ft	Z-9	---(m)	---(m)	---(m)	2.2	6.8	0				0	0	0	2.3	3.9
CPT-21A/ 86 ft	Z-9	186	194	201	192	204	165	179	171	194	159	169	164	189	170
CPT-28/ 87 ft	Z-9	213	226	217	217	223	174	180	185	216	181	202	196	0	209
W18-152/ 101 ft	Z-12	15.4	15.2	16.2				10.8	12.5	13.3	13.0	14.4	13.8	15.1	16.3
W15-8U/ 103 ft	Z-9	3.1	4.5	1.3	1.5	2.8	5.5				2.4	6.1	1.2	4.6	14.1
W18-167/ 106 ft	Z-1A	---(m)	---(m)	---(m)				0	0	0	0	0	0	3.0	1.1
CPT-4F/ 109 ft	Z-1A							1.2	2.9	0					
W18-165/ 109 ft	Z-1A	161	160	164				---(q)	0	0	0	0	0	2.5	2.2
W15-217/ 114 ft	Z-9	11.5	19.7	12.1	1.0	8.6	0				0	0	0	7.0	16.5
CPT-24/ 118 ft	Z-9				22.9	23.9	16.0								
W15-220SST/ 118 ft	Z-9				17.9	22.0	21.5								
W18-249/ 130 ft	Z-18	12.4	17.1	24.1				4.6	19.4	18.1	16.8	18.4	8.8	19.7	16.1
W15-219SST/ 130 ft	Z-9														
W18-248/ 131 ft	Z-1A	---(m)	---(m)	---(m)				---(m)	27.2	43.0	42.1	45.3	30.7	52.7	131
W15-95L/ 144 ft	Z-9	19.9	22.6	20.6	17.8	17.8	25.7				10.0	16.2	15.3	16.9	18.0
W15-219SST/ 155 ft	Z-9														
W15-220L/ 163 ft	Z-9				2.4	9.3	7.3								
W15-219L/ 175 ft	Z-9				4.5	12.2	11.7								
W15-9L/ 176 ft	Z-9	4.0	5.4	3.5	1.5	2.4	0			4.7	2.3	2.2		3.5	7.9
W15-84L/ 180 ft	Z-9				4.2	14.0	4.1								
W15-46/ 217 ft	Z-9	4.7	---(p)	2.1	0	2.6	0				0	0	0	4.0	5.7
(m) Unable to sample; well in use by Vista Engineering															
(p) Unable to pull representative sample.															
(q) Unable to sample; well in use for geophysical logging															

Carbon Tetrachloride Concentrations
Monitored at 200-PW-1 Passive Soil Vapor Extraction Wells
January 2006 - February 2007

200-PW-1	1/27/2006	2/28/2006	3/27/2006	4/28/2006	5/26/2006	6/29/2006	7/26/2006	8/29/2006	9/26/2006	10/26/2006	11/28/2006	12/20/2006	1/30/2007	2/28/2007
Location														
(Well or Probe)														
/feet bgs														
W18-6L/ 208 ft	CCl4 (ppmv)	CCl4 (ppmv)	CCl4 (ppmv)	CCl4 (ppmv)	CCl4 (ppmv)	CCl4 (ppmv)	CCl4 (ppmv)	CCl4 (ppmv)	CCl4 (ppmv)	CCl4 (ppmv)	CCl4 (ppmv)	CCl4 (ppmv)	CCl4 (ppmv)	CCl4 (ppmv)
W18-7/ 197 ft	---	---	---	---	---	---	---	---	15.8	3.7	1.4	0	4.8	4.9
W18-10L/ 183 ft	15.8	16.2	15.3	33.8	20.3	5.9	11.0	15.3	0	5.6	6.0	2.1	7.8	14.1
W18-11L/ 199 ft	12.1	13.0	3.9	14.1	11.4	11.2	10.0	12.7	11.7	0	0	2.0	12.6	7.0
W18-12/ 196 ft	7.6	9.0	0	5.4	7.2	1.8	3.0	8.4	1.3	0	0	0	4.5	3.4
W18-246L/ 170 ft	4.9	9.4	1.3	0	2.4	0	0	4.8	0	0	0	0	1.3	0
W18-247L/ 167 ft	---	---	---	---	---	---	---	---	3.7	1.7	0	0	2.2	5.3
W18-252L/ 175 ft	5.1	7.6	0	3.0	1.8	1.3	0	5.7	1.0	0	0	0	1.4	0
	---	---	---	---	---	---	---	---	---	---	---	---	---	2.1
(b) disconnected for use by Vista Engineering for cross-well seismic investigation														

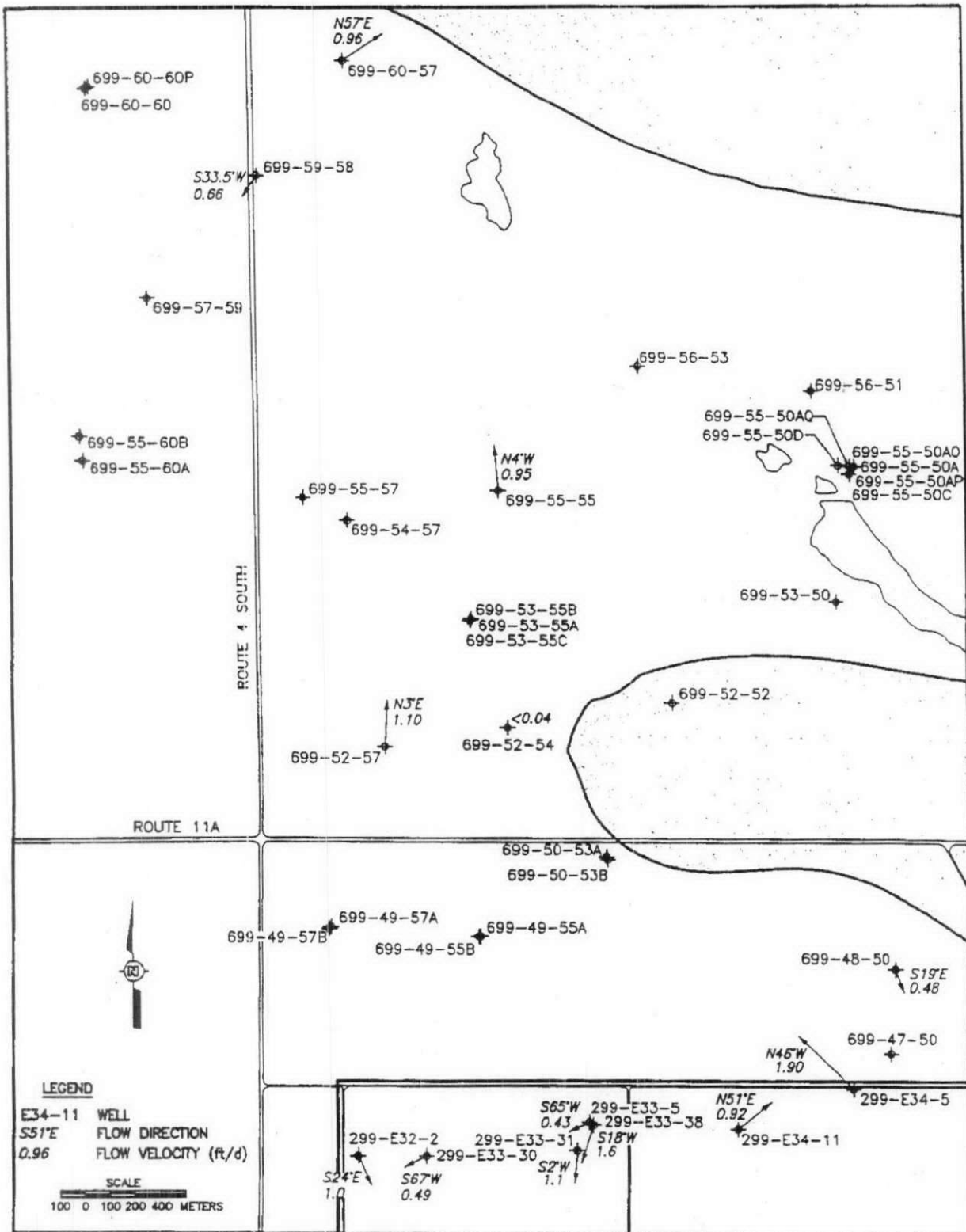
Figure 1



Attachment 14

Figure 2

In Situ Velocity Flowmeter Test Wells in the 216-BY Cribs Plume.



2E\081595A

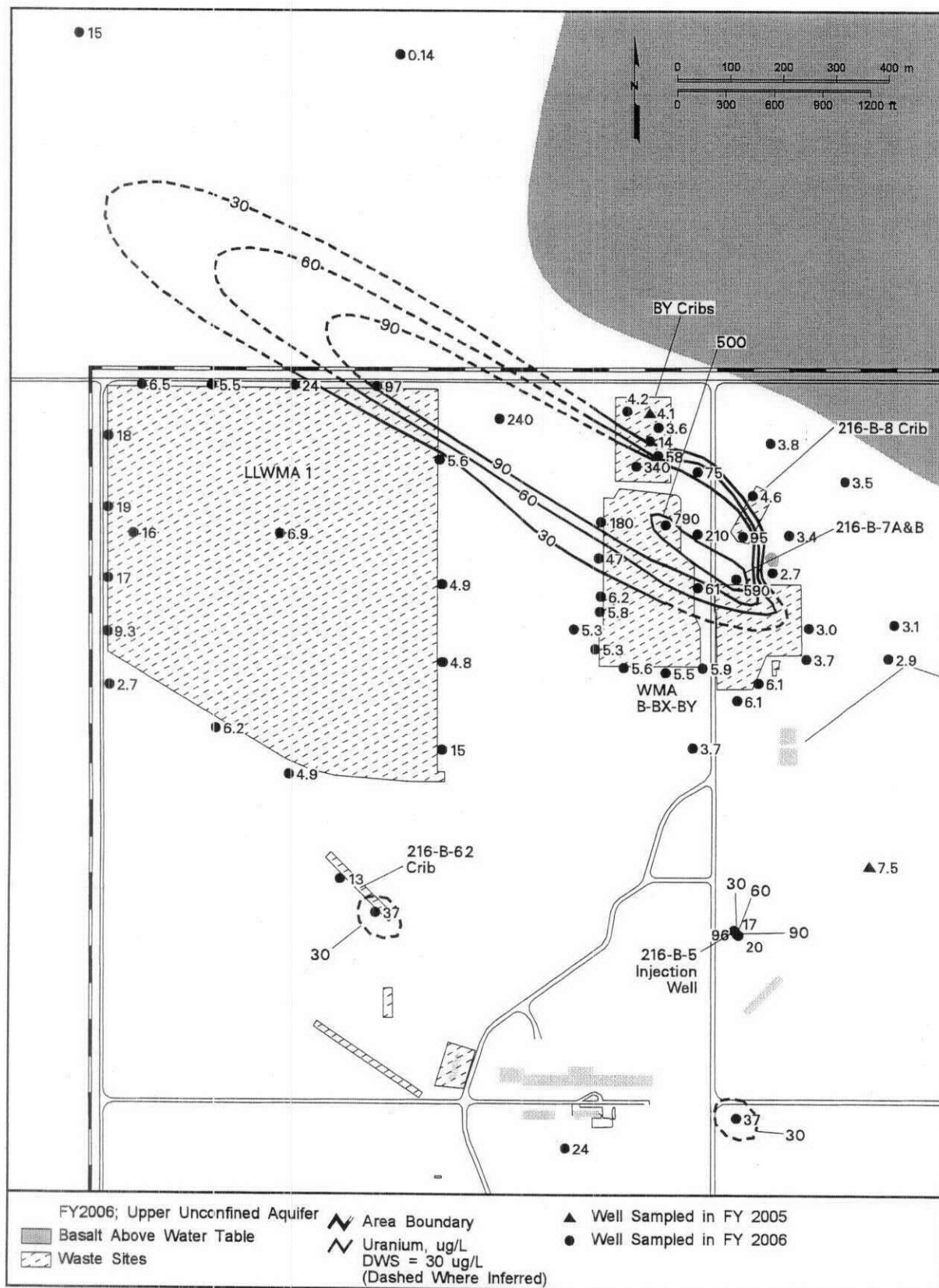
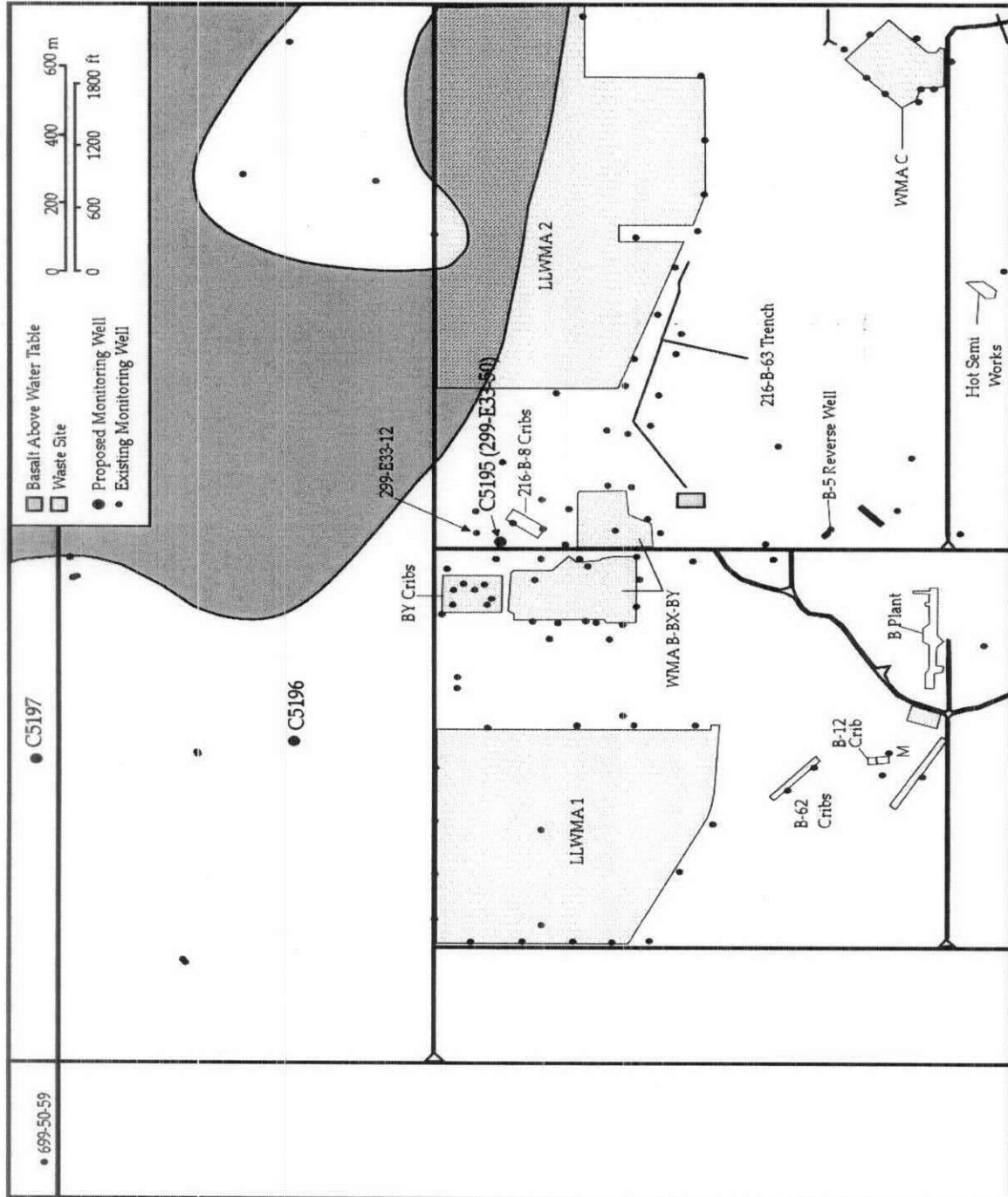
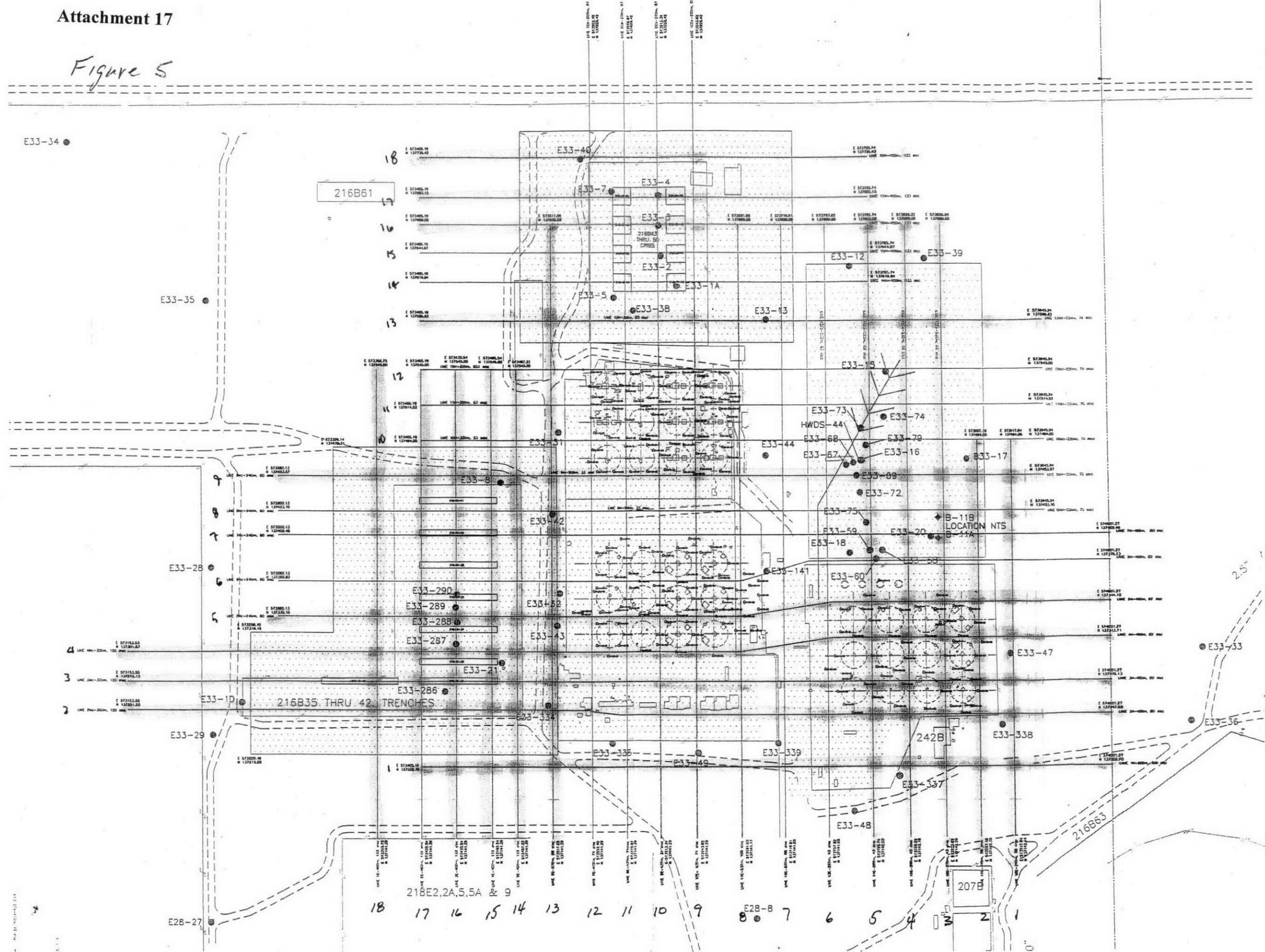


Figure 2.10-12. Average Uranium Concentrations in Northwest 200 East Area, Upper Part of Unconfined Aquifer

Figure 4. Locations of Proposed Wells Associated with 200-BP-5 Operable Unit.





200 AREA UNIT MANAGERS' MEETING SOURCE OPERABLE UNITS AND FACILITIES STATUS

March 15, 2007

SOURCE OPERABLE UNITS STATUS

M-15 TPA Milestones

- The M-15 change package has been signed by the Parties. No further reporting will take place on this item.

Discussion: RL recommends adding the M-15 milestone assumptions to the administrative record. These assumptions were used to develop the new milestones and due dates. EPA and Ecology do not agree with adding this to the Administrative Record. EPA reiterated that they will send a response letter if this letter is placed in the Administrative Record. The response letter will point out that EPA does not agree with the premise that changes from the assumptions provided with the letter would automatically constitute cause for missing or renegotiating milestones. The letter was placed in the Administrative Record by DOE on March 15, 2007.

200-PW-1, 200-PW-3, & 200-PW-6

- The PW-1/3/6 FS is progressing. Risk assessment, alternatives development, and cost estimating are well underway.
- EPA's comments on the PW-1/3/6 Remedial Investigation Report, Draft A, are being incorporated.
- TPA Change Package sent from FH to RL 3/8/07, to transfer identified waste sites from the 200-PW-1/3/6 OUs to other OUs.

200-TW-1, 200-TW-2 & 200-PW-5

- EPA comments on the Addendum to the Work Plan addressing the excavation-based BC Cribs and Trenches Area waste sites treatability test were incorporated and the document was resubmitted.

200-CW-1 (no change)

200-CW-3

- The SAP and the Work Plan were approved on 2/21/07.
- Initiated characterization sampling on sites -2, -3, -5, and -7.

Discussion: Next month add the status of the Model Group 5 work.

200-PW-2 & 200-PW-4

- At the October UMM Ecology stated that subsequent to the finalization of the M-15

TPA Change Request, Ecology plans to send a letter to DOE-RL responding to the submitted FS and accompanying closure plans.

200-CS-1

- RL/FH met with Ecology to conclude comment resolution and to present for discussion the path forward for the development of Draft B of the FS. Ecology is considering the proposed path forward (Ecology's initial response was favorable). RL proposed to direct further resources into implementing the path forward and rather than comment resolution as the comments can only be addressed by implementing the path forward. Ecology was in agreement with the caveat to consider a crosswalk from Draft B back to their comments. The value of a crosswalk is an open question.

200-CW-5, CW-2, CW-4, & SC-1

- Four waste sites in the 200-SC-1 OU need more data through the supplemental characterization efforts. Discussion continues with EPA on how the scope of the April 30, 2008 (TPA milestone M-15-40 D) 200-CW-5 Feasibility Study and Proposed Plan can be submitted in two parts. The first part will address the sites remaining in the 200-CW-5 OU. The remaining sites will be incorporated once the field work is finished and laboratory analyses are complete. EPA commented that early discussions with their legal counsel is making EPA lean towards a change package that modifies the 200-CW-5 OU group milestone and creates a new milestone to address the 200-SC-1 OU separately.

Ecological Risk Assessment

- Two of the Phase III West Lake activities will be performed in March, 2007, including pore water and brine fly sampling. This is because the SAP was approved in October, after West Lake had dried-up and the flies were no longer present.
- The Ecological Risk Assessment Report is undergoing initial text development. EPA is providing expertise to assist in the organization and content of the report.
- The March 2005 sampling performed in the BC Controlled Area to verify the presence or absence of chemical constituents will be repeated because a QC duplicate sample was not collected according to plan. This characterization is very important because it supports the establishment of the COPEC list for the Central Plateau Phase II Ecological DQO and the COPC list for the 200-UR-1 Work Plan. The sampling and analysis instruction has been revised and is being re-issued to support this characterization effort.

200-IS-1

- Presented modified PSQs to Ecology on February 21, 2007 and obtained informal agreement from Ecology. The DQO is in the process of obtaining concurrence signatures. 200-ST-1 will no longer be reported on as an OU.

Discussion: Ecology requested that a status of the work plan be added next month.

NOTE: All 200-ST-1 sites have been moved to OU 200-MG-1.

200-LW-1/200-LW-2

- Submittal of Draft A of the FS and PP has been delayed to 12/31/2011, per TPA Change Number M-15-06-05.
- Re-baseline planning for additional characterization is in progress.

200-MG-1/200-MG-2

- Planning has been initiated and baseline preparation is in progress.

200-MW-1

- A SAP for field work at 216-A-2 Crib and 216-A-21 Crib is in progress.
- Minor changes to the Waste Control Plan were presented and approved at this meeting.
- TPA Change Package sent from FH to RL 3/8/07, to transfer 216-A-2 Crib from PW-3 OU to MW-1 OU.

200-UR-1

- Rev. 0-Reissue of the Sampling and Analysis Plan approved by DOE on March 8, 2007 and approval by the Department of Ecology is in progress. Conditional approval to proceed for field sampling activities was given by e-mail on December 13, 2006.
- Geoprobe logging for the BC Controlled Area completed February 8, 2007.
- Analytical sampling (auger drilling) field work initiated March 12, 2007 and scheduled to complete the end of March.

200-SW-1/2

- Collaborative DQO workshops have been underway since late August. The DQO process is moving forward, but will require significantly more time than originally planned due to its complexity and number of regulator interests/concerns. Discussions on this topic have been held with DOE and Ecology.
- Decision makers from DOE-RL and Ecology met on November 9, 2006 and again in January to review, comment and ensure alignment on the 200-SW-2 DQO scope, objective and assumptions. Additional meetings have been and will be held this month.

Discussion: It is Ecology's expectation that the milestone date will be met. RL will proceed to meet the milestone without Ecology's concurrence on the DQO. Work Plan Strategy meetings with Ecology will continue.

BC Cribs and Trenches

- Draft DQO summary reports and SAPs addressing the excavation-based treatability test and correlation of HRR characterization with soil characterization data are being readied for submittal to RL and subsequently, to EPA.

200-UW-1

- 200-W-42 VCP / UPR-200-W-163 – A Time Critical Removal Action (TCRA) excavation completed and Phase I portion backfilled on 9/30/06. Phase II backfill pending resolution of >15' deep contamination. A BCR is being prepared which addresses RL priorities considering available funding. Excavation area monitoring (contamination and air) continues.
- ROD is being updated and reviewed to reflect recent path forward. Draft completed Feb. 28 and is being reviewed. Schedule is to issue in June 2007. Delays due to changes in ROD approach, (i.e., final vs interim for cribs). Public comment of the Proposed Plan was completed on June 30, 2005. Increased focus continues to be needed to prioritize the issuance of this decision document.
- Responsiveness summaries to public comments on TPA Change Request for reclassifying Crib 216-U-12 to a RCRA Past Practice (RPP) unit were sent for final review week of 1/15/07.
- TPA Change Request to change 216-U-15 from a CPP to a RPP has been reviewed and updated. Package will be transmitted with U-12 package for final review. No public review is anticipated for this portion of the change request.
- RAGs for 200-UW-1 need to be finalized. Several peer reviews have been completed and a presentation was made to RL and the regulators on 2/6/07. It is generally accepted that refined cleanup levels resulting from modeling efforts will not be available to meet the schedule for completing the ROD. Due to contamination >15' depth at 200-W-42 excavation establishing acceptable goals is a high priority.
- Challenges to the Area C cultural review are being made by Yakama Tribes and Washington State Department of Archaeology & Historic Preservation (DAHP). Path-forward is under RL review.
- Phase II of the 241-U-361 Settling Tank (sampling tank sludge) has begun. The SAP was signed by EPA and Ecology on March 5, 2007.

Discussion: 1) A new section/placeholder will be added to the UMM to allow for General Information Exchange and Integration.

2) The ROD training that EPA held 3/14/07 noted that Administrative Records often do not contain the actual text of ARARs as listed in RODs, and that the lack of such information can impede effective conduct of 5-year remedy reviews. The training emphasized the need to ensure that the Administrative Record contains the actual text of the appropriate revisions of specific ARARs, as listed in RODs. This gives the context in which the ROD was issued, per the ARARs at that time.

FACILITIES STATUS

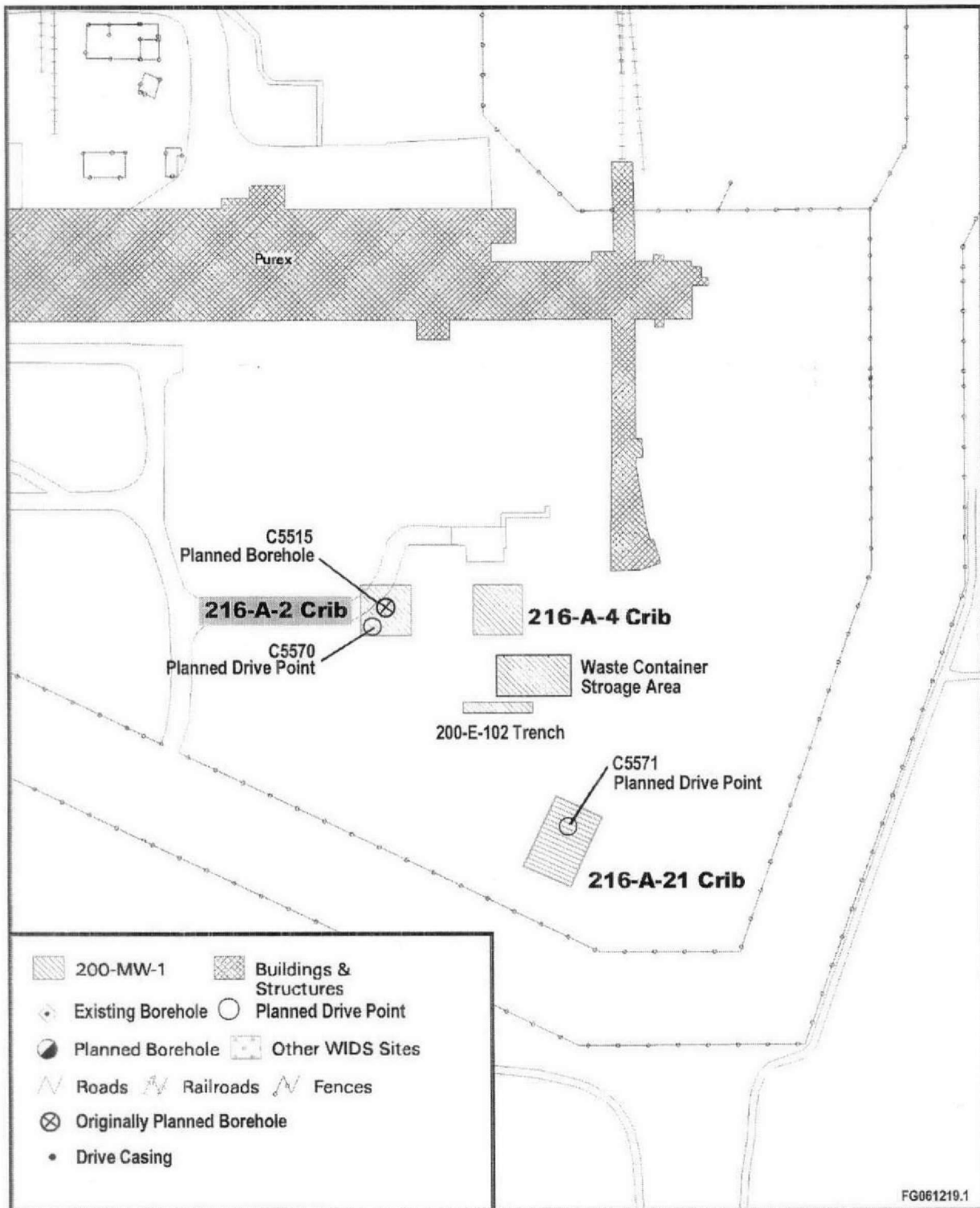
- **221-U Facility/Canyon Disposition Initiative (CDI)**
 - Continuing development of remedial design engineering alternatives studies
 - Grout study (June 2007)
 - Cell 30 tank contents removal study (June 2007)
 - Railroad tunnel reactivation study (June 2007)
 - Draft A *Remedial Design/Remedial Action Work Plan for the 221-U Facility* and an accompanying draft TPA change form were transmitted for EPA and Ecology review on 12/21/06. EPA comments were issued 3/7/07; Ecology is making use of an extension on the review period requested by EPA.
 - Continuing development of canyon waste acceptance study (June 2007)
 - Preparing to schedule PUREX canyon DQO interviews
- **Facility Binning**

Draft AIP is being updated to include proposed discussions on U Plant CDI.
- **Miscellaneous Facility D&D**

Completed structural demolition of tenth Building thus far in FY07.
One remaining building scheduled for demolition in FY07 (2715M).

WMP-20205 REV 1

Figure 1 Replacement. 216-A-2, 216-A-4 & 216-A-21 Cribs Location Map
and
Waste Container Storage Area



WMP-20205 REV 1

Table 1. Estimate of Investigation-Derived Waste Quantities.

Operable Unit	Media	Method	Soil and Waste	Miscellaneous Solid Waste	
			Cuttings (drums ^a)	PPE/Trash (drums ^a)	Disposable Equipment
200-MW-1	Soil	Drilling	150	15	0
	Liquid ^b	Drilling	8	0	0

^a208-L (55-gal) drums.^bDecontamination water.

PPE = personal protective equipment.

Table 2. List of Boreholes for Spectral Gamma-Ray Logging.

Borehole/Direct Push No.	Approximate Location
C4560	Borehole within the boundaries of the 216-A-4 Crib
C4558	Borehole within the boundaries of the 216-T-33 Crib
C4559	Borehole within the boundaries of the 216-U-3 French Drain
C5301	Borehole outside boundaries of 216-A-4 Crib due south of southwest corner of crib boundary
C5302	Drive point inside the boundary of 200-E-102
C5570	Drive point within boundary of 216-A-2 Crib
C5571	Drive point within boundary of 216-A-21 Crib
C5515	Borehole within boundary of 216-A-2 Crib

Shaded text is inclusive of changes to this table made on 2/16/07.